STATE OF MONTANA
DEPARTMENT OF TRANSPORTATION
BID PACKAGE

Sealed bids for construction of this project will be received by the Montana Department of Transportation, Construction Contracting Bureau, Room 101, 2701 Prospect, Helena, Montana until 8:30 a.m. on December 12, 2019. All bids will then be publicly opened, reviewed for correctness, and then publicly read in the Department's auditorium.

Federal Aid Project(s):

STPB-BH 6-1(142)28 Clark Fork-1 Mile Northwest Trout Creek

Bid proposals, Plans, Standard Specifications, Detail Drawings, and Standard Contract Forms are on file for examination and may be obtained from the Construction Contracting Bureau of the Montana Department of Transportation, 2701 Prospect Avenue, P.O. Box 201001, Helena, Montana 59620-1001.

Prime bidders use the Electronic Bid System or bid on-line through Bid Express to produce a bid containing Proposal Forms, Schedule of Items, and Disadvantaged Business Enterprises (DBE) Requirements (if applicable).

CONTRACT #CMC19
AWARDED ON: DECEMBER 20, 2019
TO: KIEWIT INFRASTRUCTURE COMPANY

MONTANA DEPARTMENT OF TRANSPORTATION

Barb Skelton, Chairperson
Montana Transportation Commission

Michael T. Tooley
Director of Transportation

Contract No.CMC19
JPM:JJ:8022000AWD-401

MONTANA DEPARTMENT OF TRANSPORTATION
SCHEDULE OF ITEMS

CONTRACT ID: CMC19

PROJECT: STPB-BH 6-1(142)28 (8022142000)
CLARK FORK-1M NW TROUT CREEK

PROP LINE NO.	ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY
	SECTION 0001 - APPROACHES AND STRUCTURE REHABILITATION			
0010	CMG 104 000	MISCELLANEOUS WORK	UNIT	50,000.00
0020	CMG 104 100	MISCELLANEOUS ITEMS-HOUR	HOUR	100.00
0030	CMG 104 200	CMG CONTINGENCY WORK	UNIT	159,445.00
0040	CMG 105 000	CONTRACTOR SURVEY AND LAYOUT	LS	1.00
0050	CMG 108 000	CRITICAL PATH SCHEDULE	LS	1.00
0060	CMG 109 000	MOBILIZATION	LS	1.00
0070	CMG 202 500	REMOVE DECK	SQYD	3,241.70
0080	CMG 202 550	REMOVE GUARD ANGLE	LNFT	69.40
0090	CMG 203 000	EXCAVATION-UNCLASSIFIED	CUYD	502.00
0100	CMG 208 000	BMP ADMINISTRATION	LS	1.00
0110	CMG 208 100	TEMPORARY EROSION CONTROL-FIXED	UNIT	500.00
0120	CMG 210 000	TEST TRAILER-TRANSPORT, SETUP	MILE	380.00
0130	CMG 301 050	CRUSHED AGGREGATE COURSE	CUYD	685.00
0140	CMG 301 100	AGGREGATE TREATMENT	SQYD	1,298.00
0150	CMG 401 000	COMMERCIAL MIX-1/2 IN-PG 64-28	TON	382.00
0160	CMG 402 000	EMULSIFIED ASPHALT CHFRS-2P	TON	1.80
0170	CMG 402 050	EMULSIFIED ASPHALT-FOG SEAL	GAL	82.00
0180	CMG 402 100	EMULSIFIED ASPHALT-TACK COAT	GAL	130.00
0190	CMG 409 000	COVER-TYPE 1	SQYD	1,080.00
0200	CMG 551 000	CONCRETE-CLASS DECK	CUYD	85.20
0210	CMG 551 010	CONCRETE-CLASS STRUCTURE	CUYD	19.00
0220	CMG 551 020	CONCRETE-CLASS OVERLAY	CUYD	135.90
0230	CMG 551 040	CONCRETE-CLASS JOINT	CUYD	83.70
0240	CMG 551 100	CONTROLLED LOW STRENGTH MATERIAL	CUYD	48.00
0250	CMG 552 000	TRANSVERSE DECK GROOVING	SQYD	3,523.90
0260	CMG 552 050	REVISE STRUCTURE	LS	1.00
0270	CMG 552 070	SCUPPER	EACH	36.00
0280	CMG 552 100	EXPANSION JOINT-MODULAR	LNFT	64.60
0290	CMG 552 200	SUPERSTRUCTURE JACKING	LS	1.00
0300	CMG 554 100	PRECAST DECK PANEL	SQFT	31,158.00
0310	CMG 555 000	REINFORCING STEEL	LB	3,026.00
0320	CMG 555 050	REINFORCING STEEL-EPOXY COATED	LB	828.00
0330	CMG 555 100	REINFORCING STEEL-CR-CLASS 1	LB	43,004.00
0340	CMG 556 100	STRUCTURAL STEEL-MISC	LS	1.00
0350	CMG 556 200	PAINT EXISTING STRUCTURAL STEEL	SQYD	1,828.00
0360	CMG 557 010	REMOVE BRIDGE RAIL	LNFT	282.80
0370	CMG 557 100	42 IN OPEN RAIL-BR	LNFT	2,102.00
0380	CMG 557 150	42 IN OPEN RAIL PARAPET-BR	EACH	4.00
0390	CMG 561 000	BRIDGE DECK MILLING	SQYD	503.10
0400	CMG 562 000	CLASS A BRIDGE DECK REPAIR	SQYD	85.00
0410	CMG 562 020	CLASS B BRIDGE DECK REPAIR	SQYD	2.00
0420	CMG 565 100	ELASTOMERIC BEARING DEV-PTFE	EACH	8.00
0430	CMG 606 000	REMOVE GUARDRAIL	LNFT	1,867.70
0440	CMG 606 025	RESET TEMPORARY IMPACT ATTENUATOR	EACH	2.00
0450	CMG 606 100	MGS GUARDRAIL	LNFT	9,045.50
0460	CMG 606 200	MGS INTERSECTING RDWAY TERM SECTION	LNFT	75.00
0470	CMG 606 300	MASH W-BEAM TERMINAL SECTION	EACH	9.00
0480	CMG 606 325	MASH THRIE BEAM BR APPRCH SECTION	EACH	4.00
0490	CMG 606 500	TEMPORARY IMPACT ATTENUATOR	EACH	4.00

PROP LINE NO.	ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY
0500	CMG 606 650	GUARDRAIL END SECTION WIDENING	EACH	6.00
0510	CMG 610 000	REVEGETATION	LS	1.00
0520	CMG 618 000	TRAFFIC CONTROL DEVICES-CB	UNIT	190,000.00
0530	CMG 618 100	SINGLE USE SIGNS	SQFT	590.00
0540	CMG 618 150	INSTALL, REMOVE CAMERA SYSTEM	LS	1.00
0550	CMG 618 200	TEMPORARY BARRIER RAIL	LNFT	1,380.00
0560	CMG 618 225	RESET TEMPORARY BARRIER RAIL	LNFT	1,180.00
0570	CMG 619 010	CHEVRON SIGN PANEL 24 X 30	EACH	70.00
0580	CMG 619 100	SIGNS-ALUM REFL SHEET IV	SQFT	12.80
0590	CMG 619 150	SIGNS-ALUM REFL SHEET XI	SQFT	446.50
0600	CMG 619 170	DELINEATOR DES D	EACH	352.00
0610	CMG 619 190	REMOVE SIGNS	EACH	7.00
0620	CMG 619 200	REMOVE SIGNS-GUIDE	EACH	1.00
0630	CMG 619 500	POLES-TREATED WOOD 4 IN	LNFT	787.00
0640	CMG 619 600	POSTS-STEEL U SIGN	LB	20.00
0650	CMG 620 000	STRIPING-WHITE PAINT	GAL	19.00
0660	CMG 620 010	STRIPING-YELLOW PAINT	GAL	19.00
0670	CMG 620 020	STRIPING-WHITE EPOXY	GAL	13.00
0680	CMG 620 030	STRIPING-YELLOW EPOXY	GAL	13.00
0690	CMG 620 100	TEMPORARY STRIPING	LNFT	137,500.00
0700	CMG 622 100	SEPARATION GEOTEXTILE-HIGH	SQYD	1,549.00
0710	CMG 623 100	TEMPORARY MAILBOXES	LS	1.00

TABLE OF CONTENTS
FEDERAL AID PROJECT(S) STPB-BH 6-1(142)28

SPECIAL PROVISIONS
FEDERAL AID PROJECT NO(S). STPB 8113(9)

(REVISED 1-24-19 M)

The following special provisions are hereby made a part of this contract and supplement and/or supersede any sections of the Standard Specifications for Road and Bridge Construction, adopted by the Montana Department of Transportation and the Montana Transportation Commission and all supplements thereto in conflict therewith.

The following books and Question and Answer Forum are also hereby made a part of this contract and are available upon request to the CONSTRUCTION CONTRACTING BUREAU, MONTANA DEPARTMENT OF TRANSPORTATION, 2701 PROSPECT AVENUE, PO BOX 201001, HELENA, MT 59620-1001.

(1) Book entitled “Standard Specifications for Road and Bridge Construction 2014 Edition.”

(2) Most recent version of “Detailed Drawings.”

(3) Question and Answer Forum.

The Question and Answer Forum opens at 5:00 p.m. on the bid letting advertisement date and closes at 10:00 a.m. on the Monday before the bid letting. If Monday is a state holiday, the forum will close on the Friday before the bid letting at 3:00 p.m. Questions raised by potential bidders on this project, and the answers and other information posted by the Department on the “Question and Answer Forum” can be found at the website http://www.mdt.mt.gov/business/contracting up to 5:00 p.m. on the day before the bid letting.

The U.S. Department of Transportation (DOT) operates a toll free number at 1-800-424-9071, 24 hours a day - 7 days a week. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use this number to report such activities. All information will be treated confidentially and callers may remain anonymous.

The Department attempts to provide reasonable accommodations for any known disability that may interfere with a person participating in any service, program or activity of the Department. Alternate accessible formats of this document will be provided upon request. If reasonable accommodation is needed to participate in Department bid lettings, call the Civil Rights Bureau at 444-6331 or TTY 406-444-7696 [TTY 1-800-335-7592 (toll free)].

1. PROJECT DESCRIPTION [102]

Bridge rehabilitation including new deck, rail, expansion bearings, miscellaneous structural repairs, approach roadway improvements including guardrail widening, pavement markings and signing on the Clark Fork-1 Mile Northwest Trout Creek project in Sanders County.

The project is located on Hwy 200 (State Primary Route 6) approximately 1 mile northwest of Trout Creek between RP 28.0 and RP 28.4.

2. CONTRACT TIME - COMPLETION DATE [108] (REVISED 1-21-16)

This contract is a completion date contract. The work begins on the effective date stated in the Notice to Proceed (NTP) and all work is to be completed no later than November 13, 2020. Unusually severe weather is not considered as a delay cause. The NTP will be issued with an effective date of February 10, 2020.

3. CONTRACT TIME AND INCENTIVE/DISINCENTIVE [108]

A. Description. Contract time will be assessed into 2 stages. Stage One will be assessed by a milestone date and has incentive/disincentive. Stage Two will be assessed by a contract completion date.

B. Definition of Terms. The following terms apply to this contract:

1) Contract Time. Contract time will be assessed in accordance with Subsection 108.07.

2) Full Bridge Closure. Full Bridge Closure is defined as the time when both lanes of the Clark Fork River bridge are closed for major deck removal and replacement activities and Highway 200 traffic is detoured to other routes.

3) Open To Single Lane Traffic. Open To Single Lane Traffic is defined as the time when a single lane of the Clark Fork River bridge is open to traffic. It is acceptable to utilize temporary traffic control devices while the structure is open to single lane traffic and other bridge rehabilitation and approach work occurs. It is also acceptable to utilize a restricted lane width, as approved by the Project Manager, while the structure is open to single lane traffic.

4) Stage One. Stage One includes all work associated with the Full Bridge Closure required for major deck removal and replacement activities. Do not begin Stage One until completion of the local academic 2019-2020 school year. Stage One must be completed prior to the start of the local academic 2020-2021 school year.

5) Stage Two. Stage Two includes all remaining construction activities not completed under the Full Bridge Closure. Other short-term full bridge closures may be allowed under Stage Two at the discretion of the Project Manager. Final completion of Stage two is required by November 13, 2020.

6) Daily Road User Cost. The dollar figure that represents the average daily cost to the traveling public resulting from disruption caused by the Full Bridge Closure. The daily road user cost resulting from disruption caused by the Full Bridge Closure is $9,000.

C. Incentive/Disincentive. An incentive/disincentive in the amount of $9,000 per calendar day will be applied to Stage One.

1) Early Completion. The contractor will receive an incentive of $9,000 for each calendar day prior to July 4, 2020 that the Full Bridge Closure is complete, and the bridge is Open To Single Lane Traffic. The maximum total incentive amount allowed is $90,000.

2) Late Completion. A disincentive of $9,000 per calendar day will be assessed for any calendar day after the bridge has been under the Stage One Full Bridge Closure condition for 6 weeks. The maximum total disincentive amount is limited to 50 percent of the contract amount. Liquidated damages will be assessed for late completion of Stage Two in accordance with Subsection 108.08.

D. Time Extensions. Calendar days will be added to the contract for extra work in accordance with Subsection 108.07.5. Unusually severe weather is not considered as a delay. The completion date for the stages will be adjusted for extra work performed that affects the critical path. The extra work must be shown to be on the critical path or affecting the critical path on an updated CPM schedule, as described elsewhere in the contract.

E. Conditions. Complete form MDT-CON-105-15-1, Contractor's Component Inspection upon the completion of Stage One. Stage One is complete when the Full Bridge Closure is complete and a minimum of one lane of traffic can be maintained across the bridge.

4. DISADVANTAGED BUSINESS ENTERPRISES (DBE) REQUIREMENTS [102] (REVISED 1-18-18)

The DBE goal for this contract is 0.00%. Use the AASHTOWare Project Bids™ Electronic Bid System (EBS) to print the DBE submittal and timing requirements. If the contract does not have a project-specific goal, the field will display in the AASHTOWare Project Bids™ bid file as a blank field.

List the DBE commitments in the EBS file. An on-line DBE Directory is available at: https://app.mdt.mt.gov/dbe/dbe/search.

If the DBE goal cannot be met, show a good faith effort per the Good Faith Effort Criteria and supporting forms, available at: http://www.mdt.mt.gov/publications/forms.shtml. Submit the Good Faith Effort documentation within 48 hours of the bid opening.

5. DBE QUOTES [102] (REVISED 3-10-16)

The Department has a quick and easy way for you to request quotes from Montana DBE-certified companies. The information goes to the DBE companies that same day. The on-line form is located at web site: https://app.mdt.mt.gov/dbeqt/.

Call the Department DBE Supportive Services, 1-800-883-5811, for further assistance. Using this online request form will be considered for good faith efforts, but it does not constitute meeting all requirements of good faith efforts.

6. DBE USAGE [102] (REVISED 9-21-17)

Contract specific goals are not placed on contracts; however, the Department has an overall 6.14% DBE goal it must achieve. To assist contractors in determining their DBE commitment level, the Department has reviewed the estimates for this contract, and has established an aspirational goal of 4.1% DBE usage. Although not a contract requirement, the Department believes that the aspirational goal can realistically be achieved through race neutral measures based on current availability of DBEs and standard competitive procurement processes. While the utilization is not mandatory to be awarded the project, continuing utilization of DBE firms on contracts supports the success of Montana's DBE Program.

Any project listing a 0% DBE aspirational goal does not mean that a DBE may not be used on that project. A 0% DBE aspirational goal may have been established due to any of the following reasons:

- Limited identified subcontracting opportunities;
- Minimal contract days; and/or,
- Small contract dollar amount.

Contractors are encouraged to identify any opportunities to subcontract to DBEs. The Department's DBE directory may be found at the following website: https://app.mdt.mt.gov/dbe/dbe/search.

7. LABOR REQUIREMENTS [102] (REVISED 9-5-19)

Pay the minimum wage rates contained elsewhere in the bid package. Comply with the required contract provisions contained in the form FHWA 1273 included with this contract. To obtain more information, contact the Department's Construction Engineering Services Bureau at 2701 Prospect, Helena, MT (406)475-2258, (800)335-7592 (TTY) or (406)444-7297 (Fax). The local employment service office, designated by the Workforce Service Division, Department of Labor & Industry, for this project is Thompson Falls.

Executive Orders 13658 and 13706 do not apply to this contract.

8. CERTIFIED PAYROLL COMPLIANCE ELECTRONIC PAYROLL SUBMISSION [102] (REVISED 10-10-19)

The Contractor and all subcontractors must use AASHTOWare Project Civil Rights & Labor™ (CRL) to submit Certified Payrolls (CPRs). Ensure that all subcontractors have submitted their Vendor Access Form which can be found on the following page: https://www.mdt.mt.gov/business/contracting/prevailing-wage.shtml to the Department and have received their login IDs prior to work.

Request the contract number and project ID(s) from the Project Manager. Provide the information to all subcontractors subject to the FHWA 1273 requirements. This information is

also available using the Search Awarded Contracts located at: https://app.mdt.mt.gov/project-search/project/search.

Provide assistance and ensure all subcontractors submit CPRs electronically into CRL within the required timeframe.

There are three ways to submit certified payrolls electronically into the system:

- Manually add, copy, or modify data into CRL;
- Import payroll data with the CRL payroll spreadsheet XML converter tool available at: https://xml.aashtowareproject.org/spreadsheet/; or,
- Convert payroll system program data to Payroll XML and import into CRL. Information on how to convert to Payroll SML may be found at: https://xml.aashtowareproject.org/resourcekit/

The Labor Compliance Program may at any time request paper certified payroll reports and supporting documentation from any contractor(s) working on the contract.

"Approval" of payrolls within CRL does not indicate that the Department's Labor Compliance Program has reviewed this data for accuracy or compliance with prevailing wage laws. "Approval" only indicates that payrolls have been received by the Department. The Department reserves the right under FHWA 1273 to review payrolls to ensure compliance with state and federal prevailing wage laws and other applicable labor laws.

9. ZONE PAY [102] (REVISED 5-10-18)

Wage rates and zone pay requirements can be found elsewhere in the proposal. The mileage for determining the zone is 124 miles.

Indicate the Zone requirements for all classifications. Provide this information to the Project Manager at the Preconstruction Conference on Form MDT-CON-102_02.

10. SOIL BORING INFORMATION [102] (REVISED 1-16-14)

The Department routinely conducts subsurface investigations and laboratory testing to collect soil, rock and groundwater information ("geotechnical information") within the anticipated limits of upcoming projects and maintains a comprehensive set of this information in its geotechnical file. For this contract, geotechnical information has been collected by the Department and logs of boring summarizing this information have been included in the Special Provisions and Plans. "Logs of Borings" in the Special Provisions and Plans are based on an interpretation of the field investigation and laboratory testing data, and do not include all the geotechnical information that may be available. The geotechnical information contained in the "Logs of Borings" has been edited or abridged and may not reveal all the geotechnical information which might be useful or of interest to the bidder.

The comprehensive set of geotechnical information is considered too voluminous to include in the bidding package. The geotechnical information that the Department has is available for review or copying upon request. Rock core samples are regularly retained as well. All bidders are expected to fully review all of the geotechnical information prior to submitting their bid. The prime bidder is responsible for ensuring that a firm submitting a subcontractor quote for the prime's use is aware of all available geotechnical information.

Submission of a bid without fully reviewing the Department's comprehensive set of geotechnical information or accepting a quote from a subcontractor without verifying that the subcontractor reviewed all available geotechnical information is a business decision by the bidder. Failing to fully review all available geotechnical information waives the contractor from making any claim, whether termed "superior knowledge", "justifiable reliance", "differing site condition", or otherwise, against the Department for any information that may be included in the comprehensive geotechnical information file and not shown, or not fully shown, in the "Logs of Borings" contained in the contract documents.

Soil, rock, and groundwater conditions shown on the logs of boring apply only at the specific boring locations and at the time the borings were made. They are not warranted to be representative of subsurface conditions at other locations or times. Groundwater conditions commonly vary seasonally and from that encountered during drilling. Determination of a material's classification is based in part on judgment and opinion. The Department assumes no responsibility for any variation or misinterpretation of the classification of materials.

Utilize the Question and Answer forum to request additional geotechnical information or to submit questions regarding the geotechnical information. To review all available geotechnical information, submit a request in writing to the Department's Geotechnical Section to schedule a time to review the available geotechnical information. Requests for access should be made a minimum of 10 business days prior to the bid opening.

11. 103.07 EXECUTION AND APPROVAL OF CONTRACT [103] (ADDED 6-13-19)

Use DocuSign to sign the contract in accordance with Subsection 103.07.

No later than 5 calendar days after the date of bid-opening (the date of bid opening to count as the first full day), the apparent low bidder must submit to Construction Contracting Bureau, during its regular work hours, a fully completed Contract Recipients Form documenting names and emails of authorized agents of the Contract and Surety to sign the contract. If the 5th day is a holiday, turn the documentation in earlier. The Contract Recipients Form is available at the following web page: https://www.mdt.mt.gov/publications/forms/contract-recipients.shtml.

The bid proposal may be considered non-responsive and rejected if the above form(s) are not submitted within the required time frame.

12. BIDDER'S PROPOSED AGGREGATE SOURCE(S) [103] (REVISED 1-24-19)

No later than 7 calendar days after the date of bid-opening (the date of bid opening to count as the first full day), the apparent low bidder must submit to Construction Contracting Bureau, during its regular work hours, a fully completed Form MDT-CON-106-02-3 for each aggregate source the bidder used to prepare its bid, or a subcontractor used to prepare its quote, if used by the bidder for its bid. (If the 7th day is a holiday, turn the documentation in earlier.)

The Bidder's Proposed Aggregate Source form is available at the following web page: http://www.mdt.mt.gov/publications/forms.shtml#hig.

The bid proposal may be considered non-responsive and rejected if the above form(s) are not submitted within the required time frame.

13. STEEL PRICE ADJUSTMENT [106] (REVISED 4-25-19)

A. General. The Department may apply a Steel Price Adjustment to payments for the applicable steel items of work listed in the contract as payment to the contractor or a credit to the Department. Payments will only be made for fluctuations in the cost of the steel used in the items of work listed in the contract. No adjustment will be made for changes in the cost of manufacturing, fabrication, shipping, or storage.

Payments may be positive, negative, or non-existent depending on the circumstances. Payments or deductions for the steel price adjustment will be calculated by the Project Manager. No steel price adjustments will be made for any products manufactured from steel purchased from the mill prior to the letting date.

Notify the Project Manager in writing by the Notice to Proceed date or at the pre-construction conference, whichever comes first, of intent to participate in steel price adjustment. The price adjustment will be based on a base price per pounds of steel. The base price is provided to the Department by the National Steel Bridge Alliance monthly and updated as necessary.

- The current base price per pound of steel is: $0.55.

The Department will use the Bureau of Labor and Statistics Producer Price Index (BLS PPI) “Steel Mill Products” Series ID WPU1017 not seasonally adjusted. The index used will be the final version of the index, revised 4 months after the original publication, including any corrections to the index or rebasing of the index.

B. Applicable Bid Items. The Department may apply a steel price adjustment to steel quantities in certain items. The cost of the steel within the item must be at least $5,000 to qualify for a steel price adjustment.

Nuts, bolts, rebar chairs, connecting bands, and other miscellaneous hardware items will not be included in the price adjustment. No other items will be considered for a price adjustment.

C. Steel Price Index. Furnish the following documentation for all steel bid items applicable to the steel price adjustment:

1) The weight of steel (pounds) to be incorporated into the various items of work covered by this special provision.

2) Steel Certification and Mill Test Reports.

3) The date that the steel item, subject to adjustment, was shipped from the producing mill.

Accompany the above documentation by an affidavit signed by the Contractor stating that the information provided is true and accurate. Submit all documentation, including the affidavit, to the Project Manager prior to incorporating the steel into the work. This provision in no way modifies or cancels the requirements of Subsection 106.09.

D. Steel Price Adjustment. Adjustments may be positive, negative, or non-existent depending on the difference between the Base Index (IB) and Current Index (IC). No price adjustment will be made unless the IC is 10% higher or lower than the IB.

For Increases:

Adjustment Factor (AF) = (IC/IB-1.1)
If AF is equal to or less than 0, no adjustment.
If AF is greater than 0.0, continue
Price Adjustment = AF x quantity x base price

For Decreases:

Adjustment Factor (AF) = (IC/IB-0.9)
If AF is equal to or greater than 0, no adjustment.
If AF is less than 0.0, continue
Price Adjustment = AF x quantity x base price

Where:
IB = BLS PPI for month contract was let
IC = BLS PPI for month material was purchased from the mill (invoice date)

14. STORM WATER PERMITTING REQUIREMENTS UNDER THE MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM (MPDES) [107] (REV 3-16-17)

A. Description. The Montana Department of Environmental Quality (DEQ) regulates storm water discharges under the MPDES program. If the bid package contains blank erosion control plans, a construction storm water discharge permit authorization will be required. If not, a storm water discharge permit authorization may be required for this project depending on Contractor’s operations. Sum the disturbance area (as defined by DEQ) identified in the contract with the area of disturbance caused by contractor operations to determine if the permit acreage threshold is exceeded. Contractor operations can include, but are not limited to, the

following support activities: staging areas, access roads, material storage areas, temporary concrete or asphalt batch plants, borrow areas, areas used for fill placement, etc. If the summed disturbance area is one acre or more, use the DEQ authorization to discharge under the MPDES General Permit for Storm Water Discharges Associated with Construction Activity for this project. In order to facilitate permit transfer, separate NOI packages are required for areas within the right-of-way and areas outside of the right-of-way. A Notice of Intent (NOI) package includes a Notice of Intent, with a topographic map, a Storm Water Pollution Prevention Plan (SWPPP), the erosion control plans, sage grouse consultation letter, if applicable, and supporting documentation.

Blank Erosion Control Plans, and a topographic map, are provided with the plans if the plans include greater than 1 acre of disturbance. Complete the erosion control plans as required by the general permit. Complete the SWPPP using DEQ's most current SWPPP Form.

B. Materials. Follow the requirements described in the Department's *Erosion and Sediment Control Best Management Practices Manual (December 2016).* Rescind Section 208 detailed drawings. Submit to the Project Manager for review and acceptance BMPs proposed for use that are not included in the Manual.

C. Construction Requirements.

1) MPDES Permit Required.

a) Submit one NOI package and the associated fees to DEQ for ground disturbance areas shown in the plans or within the right-of-way. For ground disturbance areas shown in the plans and any other areas within the right-of-way where Contractor activities causing ground disturbance are planned, the Contractor is the sole permittee until construction is complete and the General Permit is transferred to the Department or another entity.

The Department is not responsible for delays caused by incomplete or inaccurate submittals by the Contractor.

Comply with the requirements of the General Permit for Storm Water Discharges Associated with Construction Activity and implement the SWPPP. Provide two copies of the NOI Package submitted to DEQ and confirmation for receipt of a complete NOI Package from DEQ to the Project Manager prior to conducting any ground disturbance activities.

Do not begin construction activities until the required copy of the NOI Package submitted to DEQ and confirmation for receipt of a complete NOI Package from DEQ is received by the Project Manager.

b) Submit a separate NOI package and the associated fees to DEQ for ground disturbance and support activity areas outside the right-of-way and not shown in the plans. Contractor furnished material sources, staging areas, plant sites, or any other Contractor caused ground disturbance outside the right-of-way and not shown in the plans, are the Contractor's responsibility and must be submitted under a separate NOI package from the ground disturbance within the right-of-way. For all support activities outside the right-of-way which are not part of a larger commercial operation serving multiple unrelated construction activities, and will not continue operation beyond the completion of the contracted road construction activity, a notice of intent package must be submitted to DEQ to obtain an authorization under the storm water construction permit. Sand and gravel borrow area operations, gravel pits, and/or concrete batch plants that will continue operation beyond the completion of the contracted road project, are part of a larger commercial operation, or serving multiple unrelated construction activities must obtain permit coverage under the Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity (MSGP) regardless of acreage size of the activity if the activity does not already have MSGP authorization. The Contractor is the sole permittee until stabilization is complete and the General Permit is terminated or transferred to another entity. The Department is not responsible for delays caused by incomplete or inaccurate submittals to DEQ by the Contractor.

Provide a copy of the NOI Package submitted to DEQ and confirmation for receipt of a complete NOI Package from DEQ to the Project Manager prior to conducting any ground disturbance activities.

Be responsible for all temporary erosion, sediment, and pollution prevention controls for Contractor furnished material sources, staging areas, plant sites, or any other Contractor caused ground disturbance outside the right-of-way and not shown in the plans.

c) Complete and document all inspections in accordance with the requirements of the General Permit for Storm Water Discharges Associated with Construction Activity. Use DEQ's most current self-inspection form available online at: http://deq.mt.gov/Water/WPB/mpdes/stormwaterconstruction. Provide a copy of all inspection reports to the Project Manager.

Report potential noncompliance in accordance with applicable regulations, guidance, and permit conditions. Submit to the Project Manager within seven days of sending or receiving all correspondence to or from regulatory agencies regarding potential noncompliance or violations.

The temporary erosion and sediment control measures and devices to prevent pollution and control sediment transport and soil erosion will be inspected as part of the final inspection to ensure they are maintained and functioning properly. Do not transfer or terminate the General Storm Water Permit coverage until the BMPs are inspected and accepted and all records required under the permit, including inspection and monitoring reports, are furnished to the Project Manager. The Department may require that certain Best Management Practices (BMPs) be replaced by another type of BMP as a condition of permit transfer.

Upon approval of site conditions, measures, devices and all pertinent records, submit a signed copy of the Permit Transfer Notification Form provided by the Department. When submitting the General Storm Water Permit transfer package/application to the Department, include a check for the permit transfer fee. Make the check for the amount of the fee payable to the DEQ. The Department is not liable for the completeness or accuracy of Contractor records completed prior to the permit transfer. Upon receipt of the signed form, the Department will obtain signature of the new permit owner and submit to DEQ. Ensure permit conditions and responsibilities are met until confirmation of the transfer is received from DEQ. Defend and hold MDT harmless from any violations, claims, enforcement actions, penalties or fines issued for Contractor activities or recordkeeping that occurred prior to the transfer of the General Permit for Storm Water Discharges Associated with Construction Activity authorization.

If the Department concurs that final stabilization has been met during the final walk-through, the Contractor may submit a Notice of Termination form to DEQ. Pay the annual fee invoice due at the time of termination. Submit the annual fee invoice to the Project Manager for reimbursement.

2) MPDES Permit not Required.

The BMP-Administration item is included in contracts that may not meet either criteria for a MPDES permit but include ground disturbing activities. Complete BMP inspections and install BMPs, if necessary, in accordance with Section 208, if no storm water permit is required. Utilize form MDT-ENV-014, Water Pollution Control Inspection Report. A certified SWPPP Administrator is not required to conduct the inspections if no permit is required.

D. Method of Measurement. DEQ MPDES fees and monitoring costs associated with obtaining and maintaining the General Permit for Storm Water Discharges Associated with Construction Activity for ground disturbance areas both within and outside the right-of-way are not measured separately for payment.

If no permit is necessary, include the cost of all erosion control, devices, and inspections in the BMP-Administration bid item.

E. Basis of Payment. No additional payment will be made for the DEQ MPDES fees and monitoring costs associated with the General Permit for Storm Water Discharges

Associated with Construction Activity. Include these costs in the Temporary Erosion Control-Lump Sum bid item.

For project including the BMP-Administration item, include the cost of all erosion control, devices, and inspections in the BMP-Administration bid item. Partial payment for the BMP-Administration will be monthly based on the lump sum contract price in accordance with Table 208-1 in Subsection 208.05.1.

Payment for BMPs required by an event or extra work, and approved by the Project Manager, will be measured and paid for in accordance with the Erosion Control Rate Schedule contained in the contract at a unit price of $1.00 per unit.

15. MIGRATORY BIRD TREATY ACT COMPLIANCE - STRUCTURES [107] (REVISED 12-8-16)

A. Description. Migratory birds may nest on the structures affected by this project.

B. Construction Requirements. Use one or a combination of the following measures for structure removal or work that may directly impact active nests:

1) It is permissible to remove non-active nests (without birds or eggs), partially completed nests or new nests as they are built (prior to occupation).

2) Conduct work that may impact active nests outside of the nesting season, typically between the dates of August 16 and April 15, or when no active nests are present, or;

3) Install nesting deterrents meeting the requirements below prior to the nesting season as follows:

a) Cover or enclose all potential nesting surfaces on the structure with mesh netting or other suitable material to prevent birds from establishing new nests. Use netting or other material with no opening or mesh size greater than ½-inch. Maintain the material/enclosure until the structure is removed or work is completed, or;

b) Apply a non-toxic, non-lethal, bird roosting or landing repellent gel or liquid (do not use smell or taste deterrents) on all potential nesting surfaces on the structure in accordance with the manufacturer's instructions. Reapply the repellant as needed to maintain adequate coverage to prevent new nests from being established, or;

c) Prepare a description of alternate methods of effectively keeping birds from establishing nests during the nesting season, and submit them along with proposed installation dates and methods to the Project Manager for review.

C. Method of Measurement and Basis of Payment. Work described in this provision is not measured for payment. Consider all costs associated with this provision incidental to performance of the work. Include the cost in the cost of other items.

16. MIGRATORY BIRD TREATY ACT COMPLIANCE -VEGETATION REMOVAL [107] (ADDED 9-26-13)

A. Description. Suitable nesting habitat (trees and shrubs) exists for migratory birds within the construction limits.

B. Construction Requirements. Perform any required cutting of trees or shrubs between August 16th and April 15th. Remove only those trees and shrubs in direct conflict with the permanent construction limits. Where possible, do not remove, but trim trees and shrubs as necessary for equipment access and construction activities.

C. Method of Measurement and Basis of Payment. Work described in this provision is not measured for payment. Consider all costs associated with this provision incidental to performance of the work. Include the cost in the cost of other items.

17. WORK IN BEAR HABITAT [107] (ADDED 11-14-13)

This project is located within bear habitat, adhere to the following requirements:

- Promptly clean up any project related spills or debris.
- Camping is allowed in designated camping areas only.
- Store all food, food related items, petroleum products, antifreeze, garbage, and personal hygiene items inside a closed, hard-sided vehicle or commercially manufactured bear resistant container.
- Remove garbage from the project site daily and dispose of it in accordance with all applicable regulations.
- Notify the Project Manager of any animal carcasses found in the area.
- Notify the Project Manager of any bears observed in the vicinity of the project.

Consider all costs associated with this provision incidental to performance of the work. Include the cost in the cost of other items.

18. AIS WATERCRAFT AND EQUIPMENT INSPECTION [107] (ADDED 4-25-19)

A. Description. State laws, regulations, and rules are in effect in Montana to prevent the spread of AIS. The following website includes information to aid in the prevention of AIS: http://cleandraindry.mt.gov/.

B. Requirements. Contact Montana Fish, Wildlife & Parks (FWP) at least 2 weeks prior to operating equipment in or working within an aquatic resource. FWP may require additional inspection or action for aquatic invasive species (AIS) prior to equipment use in any aquatic resource in the State of Montana.

FWP Contact Information		
Fisheries Front Desk:	(406) 444-2449	
Watercraft Inspection Program Coordinator:	(406) 444-5383 – Office	(406) 546-3847 - Cell
Watercraft Inspection Specialist:	(406) 444-5540 – Office	(406) 465-6705 - Cell

1) Ensure all watercraft vessels and equipment that enters Montana from out of state, crosses the continental divide, or enters the Flathead basin is inspected by FWP prior to launch in an aquatic resource in the State of Montana.

2) Clean, drain, dry all watercraft and equipment according to FWP guidelines after exiting any aquatic resource and prior to launch into or use in another aquatic resource.

C. Method of Measurement and Basis of Payment. Work described in this provision is not measured for payment. Consider all costs associated with this provision incidental to performance of the work. Include the cost in the cost of other items.

19. PUBLIC INVOLVEMENT [107] (REVISED 4-25-19)

A. The Department may provide public relations or may hire a public involvement (PI) firm to develop and administer a communication plan. Coordinate activities with the PI firm or Department. The name and contact information for the PI firm will be available from the Project Manager following award of the contract.

Attend all public meetings held by the PI firm or Department. Public meetings may be held up to once per week. Provide a brief description of current operations, an anticipated schedule of work for the upcoming week, description of current detours, delays, closures, and possible effects on residents and businesses, such as temporary loss of access and construction traffic.

1) Coordinate with the PI firm or Department to develop a written summary of the intended operations at least 10 calendar days prior to the start of construction or any disruption of traffic.

2) Upon approval of a traffic control plan and at least 10 calendar days prior to beginning construction and disrupting traffic, coordinate with the PI firm or Department to provide appropriate information to the media. This information must specify at a minimum the impact of the construction on the public, duration, sequence of the work, and project overview.

B. Contractor Requirements – During Construction. For the purposes of this special provision, the period "during construction" is defined as the time beginning at the point when normal traffic operations are first disrupted and ending when all work is complete. During this period, perform the following tasks;

1) If requested, install signs on the project denoting the portable radio station information and Contractor phone number for problems and complaints regarding the project. Maintain these signs until the resumption of normal traffic operations. Install signs at locations approved by the Project Manager. Signs will be paid for in accordance with the Traffic Control Rate Schedule if required.

2) Coordinate with the PI firm or Department so they can contact and inform individual businesses and residents at least 3 calendar days prior to conducting operations at locations that may affect their access or convenience.

3) Provide contact information.

a) Provide a 24-hour contact number to the Project Manager for emergency use.

b) Provide a Contractor staffed local telephone number with live personnel available to answer the phone during working hours, for public comments, questions, or complaints. Ensure the telephone has been connected and in service before any work is commenced that has the potential for inconveniencing any residence or business establishment adjacent to the project. Make the phone number available to the public by furnishing it to the PI firm or Department for news/information releases and including it in the traffic advisory constant loop on the Department's portable radio station, if available. Do not use answering machines during working hours; answering machines are acceptable after working hours, with all messages answered by completion of the next workday. Maintain a written log of calls that identifies the caller; the nature of the comment, question, or complaint; and disposition. Make the log available to the Project Manager upon request.

c) Act within 24 hours to resolve complaints about safety and convenience. Refer changes in project design, traffic control, or extra work to the Project Manager for approval before acting.

4) The PI firm or the Department will update the media. Coordinate with the PI firm or Department so they can provide regular, at least once per month, project status reports and future impacts to the travelling public, landowners, and businesses. Make updates and traffic advisories available to them as well to facilitate positive news coverage. The goal is to garner news coverage of the project any time major changes or milestones occur.

Coordinate with the PI firm or Department so they can provide project advisories in the form of radio spots, if requested.

Ensure advisories include the Contractor provided contact number for the public to call for additional information. Coordinate with the PI firm or Department to update the advisories after every weekly progress meeting; or more often if conditions change substantially, such as significant unanticipated schedule changes and changes in detour routes as applicable.

C. Method of Measurement and Basis of Payment. Public Relations and coordination with the PI firm is not measured separately for payment.

This provision does not alter or cancel any other contract provision such as, but not limited to, control of the work, legal relations and responsibility to property owners, and measurement and payment.

20. STATUS OF UTILITIES [108] (ADDED 1-1-03)

Utility relocation work is not complete and will not be complete as of the letting date and contract award date. Project work must be coordinated with the utility company relocation activities until the utility relocation work is complete. Under no circumstances will a delay in relocating utility facilities be considered as justification for additional compensation.

Should unforeseen conditions arise which substantially delay the utility relocation work, and the delay results directly in a delay to the project work, make a written request to the department for a time extension, see Subsection 108.07.4.

Utility	Utility Type	Contact	Phone	Email
Blackfoot Telecommunications	Communication	Don Eickhoff	(406)827-3323	*deickhoff@blackfoot.com*
Northern Lights Inc.	Power	Kristin Mettke	(208)255-5395	*kristin.mettke@nli.coop*
Bonneville Power Administration	Power	Dustin Smith	(406)751-7824	*dtsmith@bpa.gov*

21. SUBCONTRACTING CONSULTANTS [108] (REVISED 2-27-14 M)

The following consultants performed work on the project.

- HDR Engineering
- DJ&A, P.C.
- Tetra Tech, Inc.

22. NOTICE TO BIDDERS [108] (ADDED 11-21-08)

This project is funded in whole or in part by funds received from the Federal Highway Administration (FHWA), and its construction is wholly contingent on the state's continued receipt of those federal funds. If the federal funds are reduced or not received, the Department may choose to terminate the contract for convenience under the provisions of Subsection 108.10. Any bidder on this project, by submitting its bid, understands and accepts the possibility of the contract being terminated in the event federal funds are reduced or not available and by submitting a bid, each bidder waives any claims for costs or damages other than as specifically allowed by Subsection 108.10.2. In particular, bidders understand and accept that no payment will be allowed for any claimed anticipated profit for work not performed.

23. SEQUENCE OF OPERATIONS [108]

A. Description. This work includes coordination and staging of construction operations to complete activities in accordance with the contract.

B. Materials. Vacant.

C. Construction Requirements.

1) In addition to the requirements of Subsection 104.05, Maintenance of Work, and Subsection 108.04, Limitation of Operations, schedule operations in sequences outlined below to provide the least amount of inconvenience possible to the traveling public, nearby property owners, and local businesses.

2) Working Days. Work is allowed from Monday through Saturday excepted as noted otherwise in the contract. Construction work may not occur on No Work Days as defined in the Standard and Supplemental Specifications unless otherwise approved by the Project Manager.

3) Participate in weekly coordination meetings with MDT and other stakeholders as determined by the Project Manager to discuss project schedule, status, and upcoming work items.

4) Accommodate access to Old Highway 200, Blue Slide Road, and recreation access points on the river.

5) Coordinate with MDT and critical services including fire, law enforcement, ambulance, mail, schools, and other services designated by the Project Manager to help accommodate the needed coverage of those services during construction.

6) Close the bridge to traffic during deck replacement work. Prior to and after the deck replacement work, maintain single lane traffic across the bridge. Maintain a minimum traffic lane width of 12-ft during single lane closures. Submit the detailed traffic control plan for approval.

7) Develop a sequence of operations for the project. One possible sequence of operations is as follows:

a) Install traffic safety elements on Blue Slide Road as described elsewhere in the Special Provisions.

b) Install traffic signing at key decision points to notify travelling public of upcoming bridge closure as described elsewhere in the Special Provisions

c) Complete installation of work platforms below the existing bridge while maintaining single lane traffic across the structure.

d) Close the bridge to traffic and replace the existing concrete deck and complete other below deck bridge work items.

e) Open the bridge to single lane traffic and complete the concrete overlay on one half of the bridge. Move traffic onto the new deck surface and complete the concrete overlay on the opposite side of the bridge.

8) Project Milestones. Refer to other requirements of the contract for start and completion dates and restrictions associated with lanes closures.

D. Measurement and Payment. All work required by this provision is measured and paid for at the unit quantities and prices bid for the respective items of the contract. Where work is specified and not distinctly covered by a unit quantity and price, that work is considered incidental to and absorbed in the various bid items of the contract and no separate payment will be made.

24. CONSTRUCTION WITHIN BPA EASEMENT

Description. Notify the Bonneville Power Administration (BPA) any time work is to be done within the BPA easement area. The contact person is:

Dustin Smith
Realty Specialist, BPA
406-751-7824 (office)
406-260-7756 (cell)

Before initial construction activities begin, schedule employees to attend a brief safety training provided by BPA.

No storage of flammable materials or refueling of vehicles is allowed within the easement area.

Do not interfere or obstruct access to transmission line structures by BPA's maintenance crews.

25. BPA SAFETY WATCHER

A. Description. The Bonneville Power Administration (BPA) requires use of a Safety Watcher during specific construction activities within BPA easements. Notify BPA anytime work is to be done within the BPA easement. Employ a BPA approved safety watcher during overhead construction activities occurring under the conductors, with any piece of equipment that has the potential to elevate 19 feet above the existing terrain and also as required by the MDT Project Manager.

Contractor's equipment to remain at least 15 feet away from transmission line conductors.

Contact information for BPA-approved Safety Watchers are:

COMPANY	CONTACT NAME	PHONE NUMBER
Christenson Electric	Tim Stevens	503-419-3605
EC Company	Matt Ramsay	503-278-6048
Resource Management Assoc. (RMA)	Lane Kadel	503-803-2029
Power Technology Inc. (PTI)	Carlos Ives	360-852-3145

B. Measurement and Payment. BPA Safety Watcher will be paid by the hour and included in the Miscellaneous Items – Hour item.

26. DAMAGE TO PROPERTY

A. Description. Retain and protect all property of the Bonneville Power Administration (BPA). Damage to BPA property caused by contractor activities or use of easement area may be repaired by BPA and the actual cost of such repair to be charged against the contractor, at no cost to MDT.

B. Measurement and Payment. No separate measurement and payment will be made for restoration and repair of damage to BPA property caused by contractor activities or use of the easement area.

27. TEMPORARY MAILBOXES

A. Description. Furnish and install temporary cluster mailboxes at each end of Blue Slide Road to accommodate mail pickup during construction.

B. Construction Requirements.

1) Coordinate with the postal service and Project Manager to determine the location and number of boxes required at each end of Blue Slide. For bidding purposes, up to 200 mail lockers are required at each end of Blue Slide Road.

2) Furnish pedestal style metal cluster mailboxes suitable for outdoor use and approved by the US Postal Service. Provide all other incidentals necessary for grading and constructing the foundations for each cluster.

3) Remove the temporary cluster mailboxes after construction is complete.

C. Measurement and Payment. Include all costs associated with furnishing, installing, and removing cluster mailboxes in the Temporary Mailboxes item.

28. LONGITUDINAL JOINT COMPACTION [401] (REVISED 10-10-19)

Construct all longitudinal joints of new plant mix with either a notched wedge joint or taper the joint edges at a 4H:1V to 6H:1V slope. Confined joints created when paving against a vertically milled surface are excluded from the requirements of this provision.

If using a notched wedge, ensure the notched wedge joint has a vertical edge of at least the maximum aggregate size and no more than ½ of the compacted lift thickness and then taper down on a slope not steeper than 4H:1V. Uniformly compact the sloped portion of the plant mix notched wedge joint. Use a device attached to the screed for shaping and compaction. Submit information on the device used to the Project Manager.

When placing the second pass (hot lane), overlap the paver screed 1.0 ± 0.5 inches onto the cold plant mix. Do not "bump back" or rake the overlapped material.

Complete compaction rolling in accordance with Subsection 401.03.21. Compact the joint area to at least 91.0% of target maximum specific gravity as determined in accordance with MT 328 with the following exceptions:

- 90.0% - ⅜-inch (9.5 mm) mixes with plan depths of less than 0.12-foot (36 mm).

The joint density is determined from cores taken at randomly selected locations after all rolling is complete and before the roadway is open to traffic, based on the length of joint constructed. The joint area is defined as the tapered area at the overlap of the hot and cold lanes. Furnish the Department with a 4-inch or 6-inch core of the compacted joint for every 4000 feet of joint constructed, and at least 3 per project, at locations directed by the Project Manager. Center the core within the tapered area to include both the hot lane and cold lane. Mark the core as directed. Patch the core holes in accordance with Subsection 401.03.21.

Density acceptance by cores for longitudinal joints does not apply to leveling or isolation lifts that have a depth of less than 0.10-foot (30 mm) thick, or first lifts of plant mix surfacing placed directly over crushed aggregate courses.

Separate the plant mix lift to be tested from the total core. Cut the core to the actual lift thickness within ± 0.15-inch (4 mm). The Department recommends using a saw to separate the lift to be tested from the total core. Perform this work within the project limits or other approved location.

The Inspector will witness all of the above activities before traffic is permitted to use the plant mix lift being tested.

Furnish the core immediately to the Inspector after it is removed, marked and separated. Do not remove the cores from the Inspector's visual control at any time. Re-core as directed any time either the Contractor requirements or procedures within this section are not met. The test results of the replacement core to be used in the QA evaluation for the lot represented will be the actual relative in-place density unless it exceeds:

- 90%; then 90% will be used for the relative in-place density of that core in the QA evaluation.
- 89% for ⅜-inch (9.5mm) mixes with plan depths of less than 0.12 foot (36 mm); then 89% will be used for the relative in-place density of that core in the QA evaluation.

MT 328 is used to establish the target Rice density. The bulk specific gravity (AASHTO T 166) determined for each core will be divided by the target Rice density in effect at the time the hot lane mix was produced to determine the relative in-place density. In the event the rolling Rice density differs by 0.5 lbs/ft^3 between the hot and cold lanes, the Rice densities for that location will be averaged. All results will be reported to the tenth of one percent (0.1%).

The approximate joint quantity represented by each sub-lot is 4000 feet. Additional locations and tests may be required. The quantity represented by 5 tests or approximately 20,000 feet of longitudinal joint constitutes a lot whenever production schedules and material continuity permit. A lot represented by 3 to 7 consecutive random sub-lots will be established when there are short production runs, significant material changes, or other unusual characteristics of the work.

Include all costs of furnishing and cutting the cores in the cost of plant mix surfacing. No separate measurement or payment will be made.

Longitudinal joints are evaluated for density on a lot-by-lot basis in accordance with Subsection 105.03.2 using an F factor of 3. The pay adjustment will be calculated using the equation below. The unit cost will be $4.50/foot of joint. Length is the length of longitudinal joint in the lot.

Pay adjustment = (P/100) x Length x Unit Cost

A 0.05 pay factor will be applied to the lots of longitudinal joint when the average density for the lot (Xn) is from 92.0% to 95.0%, inclusive, of the Maximum Specific Gravity (Rice's Method) and the range (R) is 3 or less.

Include all costs associated with constructing the joint in the cost of plant mix surfacing.

29. SURFACE PROFILE DEFECTS [401] (ADDED 11-14-19)

Correct surface profile defects greater than 0.40 inches (10 mm) in a distance of 25 feet (7.62 m) within 30 calendar days of notification but prior to seal and cover or plant mix seal operations. Correct surface profile defects by milling and filling deficient pavement depths or by diamond grinding excess pavement depths full travel lane width. Corrected surface profile defects will be retested and evaluated. Pavement thickness will be measured after profile corrections are made. Ensure corrected pavements do not create a transverse height difference between adjacent lanes exceeding ⅛-inch (3 mm). Fog seal corrected areas if the roadway is not chip sealed prior to winter suspension.

30. EMULSIFIED ASPHALT [402] (REVISED 9-21-17)

A. Description. The work is furnishing emulsified asphalt for fog seal or tack coat. The rates shown and the basis of plan quantity are calculated based on undiluted material quantities.

B. Materials. Furnish all emulsified asphalts in accordance with Section 402 and 702.

C. Construction.

1) Use and Application. Furnish and apply emulsified asphalt in accordance with Table 402-3.

Table 402-3

Bid Item	Materials Allowed	Minimum Diluted Residue [1]	Undiluted Shot Rate	
TackCoat [3]	SS-1h, CSS-1h	28.5%	0.05 gal/sy [2]	
Fog Seal			over chip seal	over rumble strips
			0.075 gal/sy	0.05 gal/sy [2]

Note 1: If diluted, as tested out of the distributer, as applied.
Note 2: Apply a double shot of emulsion on concrete surfaces and over rumble strips.
Note 3: When placing tack coat for microsurfacing operations, CQS-1h may also be used.

The contractor may dilute the material as needed to achieve the required undiluted shot rate. Notify the Project Manager of any dilution and the percentage before applying the material. Ensure the dilution rate, if applicable, is indicated on the bill of lading and/or certificate of compliance.

When fog sealing a chip sealed surface, if the material will be diluted, furnish emulsion that has been diluted at the supplier.

When applying tack coat, meet all requirements of Subsection 407.03 other than the dilution and shot rate requirements.

When a double shot of emulsion is called for in the contract, apply 2 applications at the minimum rate specified above. Ensure the first shot is cured prior to applying the second. The minimum undiluted residue is applicable to each shot. If an undiluted emulsion is applied, one shot at twice the minimum rate may be used if approved by the Project Manager.

2) Testing and Acceptance. All emulsified asphalt will be sampled, tested and accepted in accordance with Subsection 402.03. Any diluted emulsion found to be below the minimum residue will not be measured for payment.

D. Method of Measurement. Emulsified asphalt is measured by the undiluted gallon in accordance with Subsection 402.04. When not specified as a contract pay item, emulsified asphalt is not measured separately. Include the cost of emulsified asphalt in the associated work items. Water for diluting emulsified asphalt is not measured separately for payment.

E. Basis of Payment. Payment for the completed and accepted quantities is made under the following:

Pay Item	Pay Unit
Emulsified Asphalt	Gallon

Payment at the contract unit price is full compensation for all necessary resources to complete the item of work in accordance with the contract.

31. EMULSIFIED ASPHALT CHFRS-2P [402] (ADDED 10-10-19)

Furnish CHFRS-2P for areas specified in the contract. Furnish CHFRS-2P in accordance with the table below. Polymerize CHFRS-2P emulsions using at least 3% polymer by weight (mass) of the asphalt binder.

POLYMER MODIFIED CHFRS-2P EMULSIFIED ASPHALT

Property	Test Method	CHFRS-2P
Viscosity at 122 °F (50 °C), sec.	AASHTO T 59	100-400
Sieve, %	AASHTO T 59	0.1 max.
Settlement, 5 days, %	AASHTO T 59	5 max.
Demulsibility, %	AASHTO T 59	60 min.
Storage stability test, 1 day, %	AASHTO T 59	1 max.
Particle charge	AASHTO T 59	Positive
Tests on residue by evaporation: % residue[1] Oil Distillate penetration, 100 g, 5 sec. at 77 °F (25 °C), dmm ductility at 77 °F (25 °C), 5 cm per minute, cm elastic recovery, % Softening Point, °F Float Value @ 140 °F, Sec Viscosity @ 140 °F, Poise Solubility in Trichloroethylene, %	 AASHTO T 59 AASHTO T 59 AASHTO T 49 AASHTO T 51 AASHTO T 301 AASHTO T 53 AASHTO T 50 AASHTO T 202 AASHTO T 44	 65 min. 0.2 max. 90-160 75 min. 55 min. 130 min. 1800 min. 1300 min. 95 min.

32. FOG SEAL OVER SEAL & COVER [409] (REVISED 12-8-16)

A. Description. The work is applying a fog seal coating over chip sealed surface.

B. Reserved.

C. Construction.

1) Apply fog-seal immediately after initial sweeping and brooming. Ensure surface is clean and dry. Follow manufacturer's recommendations for temperature and surface conditions. Provide structure protection in accordance with Subsection 410.03.9.

2) Before starting full production, complete a test section of at least 2000 feet long to verify the application rate and adjust accordingly. Demonstrate a uniform application of fog seal producing 100% coverage of surface after curing. Do not adjust the application rate beyond the allowable tolerance without the approval of the Project Manager.

3) Apply fog-seal to all areas identified in the plans. Use nozzle size recommended by manufacturer. Meet all applicable requirements of Section 407. Overlap adjacent passes.

4) Open to traffic only after fog-seal has fully cured. If the fog seal is applied too heavily, apply blotter material consisting of crusher reject natural fines as directed. Blotter will

not be measured and paid for; all costs are included in the cost of the fog seal. Do not perform final sweeping and brooming on chip seal covered by fog seal.

D. Method of Measurement and Basis of Payment. Emulsified asphalt for fog sealing is measured and paid for as described elsewhere in the contract.

33. BASE PRICE FOR CONCRETE [551] (ADDED 3-12-15)

Price Reductions for Class Structure, Deck and Overlay items measured by the cubic yard will be calculated using the greater of the contract bid price or $500 per cubic yard. Price Reductions for Class Drilled Shaft item will be calculated using the greater of the contract bid price or $300 per cubic yard.

34. ADHESIVE ANCHOR SYSTEM

A. Description. This work includes installing threaded rods or deformed reinforcing bars into hardened concrete. The adhesive anchor system includes all the labor, adhesive materials, and equipment necessary for proper installation.

B. Materials.

1) Use an adhesive anchor system that meets the requirements of AASHTO M 235 / ASTM C881, Type IV and as specified on the Plans.

2) Select an appropriate class for the anticipated installation temperature.

3) Select the appropriate grade for the specified anchor position.

4) Use a system that is specifically developed for use in anchoring and doweling applications.

C. Construction Requirements.

1) Install the adhesive anchor system according to the Manufacturer's Printed Installation Instructions.

2) Drill the anchor holes at the locations shown on the plans. If reinforcing steel is encountered at the plan locations, then relocate the holes to avoid damaging the reinforcing bars.

a) Reinforcing steel that is damaged while drilling anchor holes may require corrective actions.

b) The Project Manager and Design Engineer will determine the severity of the damage and if corrective actions are warranted.

c) Corrective actions that are required due to anchor drilling will be at no additional cost to the state.

3) Submittals. Submit the following documentation for approval:

a) Adhesive anchor product data sheet.

b) Manufacturer's printed installation instructions.

c) Contractor's work plan for installing the adhesive anchors.

D. Method of Measurement. Adhesive anchors will not be measured directly for payment.

E. Basis of Payment. Include all costs associated with Adhesive Anchor System is included in the bid price for Reinforcing Steel.

35. LEAD BASED PAINT REMOVAL AND DISPOSAL

A. Description. Lead and other heavy metal based paint removed from highway bridge structures is considered hazardous waste. Remove lead-based paint from steel bridge components, as necessary, to complete the objectives of the project.

Paint is regulated as lead-containing when concentrations exceed 5,000 milligrams per kilogram (mg/kg) or 0.5% by weight. Testing for lead has been conducted on the project bridge paint using X-ray Fluorescence (XRF) analysis. The EPA standard for lead-based paint is 1.0mg/cm^2 by XRF analysis. Results of XRF analysis indicate total lead content in the paint of multiple steel elements is greater than 1.0mg/cm^2 which indicates the painted surfaces should

be treated as lead hazardous waste. All of the bridge steel elements including the guardrail, bearings, girders, transverse floor beams, expansion joints, stringers, and downspouts appear to contain lead based paint with concentrations greater than 1.0mg/cm^2 per the results of the XRF analysis. Additional information on the results of the testing can be provided upon request.

Lead-based paint can cause serious health effects on workers and the environment if precautionary measures are not conducted. Any work that disturbs the paint may (1) expose workers to health hazards and (2) produce debris containing heavy metals in amounts that exceed hazardous waste thresholds established in state and federal regulations.

B. Construction Requirements.

1) Remove lead-based paint in locations indicated elsewhere in the contract or as directed. Do not allow paint to escape into the environment. Immediately halt work if removed lead-based paint waste is observed to enter the environment and re-evaluate work procedures to ensure complete capture of lead-based paint waste.

2) Test waste streams, as needed, and directed by the disposal facility accepting lead-based paint waste. Provide all analytical results to the Project Manager.

3) Containerize and dispose of any lead-based paint waste in accordance with applicable regulations which may include RCRA regulations (40 CFR Parts 266-299). Comply with all storage and transportation requirements.

4) Contractor Responsibilities. Be familiar with and perform all work in accordance with all applicable standards provided in the Code of Federal Regulations, Title 29 Part 26, including the OSHA Hazard Communication Standard (29 CFR 1926.59), the OSHA Lead Standard (29 CFR 1926.62), and the OSHA Respiratory Standard (29 CFR 1926.134); the Resource Conservation and Recovery Act (40 CFR Parts 266-299) and Administrative Rules of Montana Title 17 Chapter 53. To obtain copies of the Federal regulations, contact the US Governments Printing Office at (202) 783-3238. Questions concerning state regulations or to obtain copies of state regulations, contact the Montana Department of Environmental Equality, Hazardous Waste Program at (406)444-5300.

C. Measurement and Payment. This item is not measured for payment and is considered incidental to other items.

36. TEMPORARY BRIDGE SCAFFOLDING

A. Description. Design, furnish, and install temporary scaffolding and work platforms on the existing structure in order to complete the work as specified herein and as approved by the Project Manager.

B. Submittals. Submit for approval the proposed scaffolding plan details, method of erection, and design calculations. Include detailed drawings for the scaffolding including: material types, scaffolding dimensions, support locations, and details for any proposed attachments to the existing structure. Design the scaffolding and containment system under the proposed working conditions. Consider additional loading on the bridge that may be present depending on when the scaffolding is in place and what construction operations are occurring. Evaluate reactions and stresses on the existing structure. Limit the total service load reaction due to the proposed containment and scaffolding system on a single girder to within safe operating limits and evenly distribute the loads such that individual point loads do not damage or deform the existing steel. Perform the design in accordance with AASHTO unless approved otherwise by the Project Manager. Submit calculations signed and sealed by a Professional Engineer licensed to practice in Montana.

C. Construction Requirements. Attach scaffolding to the existing superstructure using mechanical beam clamps or other means that do not damage the existing members. Do not weld to existing steel members. Evenly distribute the weight of the scaffolding system to all of the existing main superstructure girders. Continually monitor the scaffolding and connections to the existing structure. Immediately correct any condition where damage to the existing

structure has occurred from the scaffolding or work platform. Repair the structure to the satisfaction of the Project Manager.

D. Basis of Payment. Consider all costs associated with this provision and its requirements incidental to performance of the work. Include the costs in the cost of other items.

37. CORROSION RESISTANT REINFORCING STEEL

A. Description. Furnish all materials, labor and equipment necessary to furnish, protect and place the reinforcement steel identified as Corrosion Resistant to the dimensions shown on the plans or otherwise established by the Project Manager.

B. Materials. The second sentence in Subsection 555.02 beginning with “Use reinforcement listed on the QPL and in accordance with Section 711.” is rescinded.

Furnish materials meeting the following requirements:

1) Corrosion Resistant Reinforcing Steel – provide reinforcing steel conforming to the requirements of ASTM A1035/A1035M – Standard Specification for Deformed and Plain, Low-Carbon, Chromium, Steel Bars for Concrete Reinforcement – Type A1035 CS Grade 100.

2) Corrosion Resistant Reinforcing Mechanical Couplers – provide in-line mechanical couplers meeting the material requirements of B.1 as well as the Mechanical Rebar Connector requirements of Section 711.18.

3) Tie Wires and Supports-provide tie wires that are plastic coated. Support reinforcement with plastic coated steel bar supports. Do not use precast concrete bar supports, galvanized bar supports, plastic/composite bar supports, or epoxy coated bar supports.

C. Submittals. Provide all documentation required in Subsection 555.03.5. Submit two 3 FT sections of reinforcing steel from each shipment for testing. Reinforcing steel will be tested using MT 414.

D. Construction Requirements. Fabricate, protect and construct corrosion resistant reinforcing steel in compliance with Subsection 555.03 requirements.

E. Method of Measurement. Corrosion Resistant Reinforcing Steel is measured for payment per the requirements of Subsection 555.04.

F. Basis of Payment. Payment at the contract unit price is full compensation for all necessary resources to complete the item of work in accordance with the contract. Recalculation of reinforcing steel weight and pay schedules meet the requirements of Subsection 555.05.

Pay Item	Measurement Unit
Reinforcing Steel-CR-Class 1	Pound (lb)

38. MODULAR EXPANSION JOINT

A. Description. Furnish all materials and labor to design, fabricate, assemble, install, and test the modular joint system as shown on the plans and defined in this provision. Provide a modular expansion joint device that seals the deck surface, gutters, and curbs as indicated on the plans, and prevents water from seeping through the joint area. Provide a continuous full length shop fabricated modular joint system that consists of a preformed elastomeric expansion joint seal mechanically held in place by steel edge members and separation beams and remains stable under all conditions of expansion and contraction. Use manufacturer’s whose modular expansion joints have met the fatigue resistance characterization requirements stipulated elsewhere in this provision prior to award. Testing required to establish the fatigue resistance of a specific proprietary system cannot be performed after award of the contract.

B. Materials. Furnish all materials as specified by the approved joint supplier and equipment required to complete the work.

1) Structural Steel. Furnish structural steel meeting the requirements of ASTM A709 Grade 50, galvanized.

2) Stainless Steel. Provide stainless steel conforming to ASTM A 240 Type 304

3) Aluminum. Aluminum components are not permitted.

4) Polytetrafluorethylene (PTFE). Provide 100% virgin Teflon, woven PTFE fabric, or dimpled PTFE conforming to the requirements of Section 18.8 of the AASHTO LRFD Bridge Construction Specifications

5) Expansion Joint Seals. Limit the maximum size of any expansion joint strip seal to 3 inches. Do not use box-type seals or seals utilizing double webs. Provide continuous seals without splices.

Property	Test Method	Range of Values
Hardness, Durometer A	ASTM D2240	55-70
Tensile Strength	ASTM D412	2000 psi Minimum
Elongation at Break	ASTM D412	250% Minimum
Compression Set at 72 hr. at 212°F	ASTM D395	40% Maximum

6) Bolts, Nuts, and Washers. Use bolts and hardware conforming to the requirements of ASTM F3125 Grade A325 Type 1 and galvanized in accordance with ASTM F2329 and the Standard Specifications.

7) Welded Concrete Anchors. Provided headed anchors meeting the requirements of ASTM A108 and as detailed in the shop plans.

8) Blockout Concrete. Use Concrete Class –Deck for the expansion joint blockout.

C. Design Requirements. Design the modular joint system in accordance with the current AASHTO LRFD Bridge Design Specifications, the movements shown on the plans, and other requirements included in this provision.

1) Design and provide a watertight system

2) Design the elastomeric or urethane springs and bearings to be removable and replaceable.

3) Design the joint to allow for replacement of the strip seals from the roadway surface with 1.25 inch minimum gap width.

4) Do not allow the joint seals to protrude above the top of the joint and design the system to remain stable without appreciable change in the deck surface plane under the range of motion. Split extrusions may be used at the curb upturns.

5) Account for the effect of all rotations and movements permitted by the bearings in the design of the joint system.

6) Review the plans and provide revisions to the reinforcing steel and concrete cover near the joint to minimize cracking.

7) Design the system to minimize potential for fatigue damage.

D. Submittals.

1) Manufacturer’s Qualifications. Use a modular joint manufacturer experienced with the design and fabrication of modular joints and that is certified through the AISC Quality Certification Program under the category for Simple Steel Bridge Structures. Submit for approval the manufacturer’s qualifications prior to ordering materials and beginning the work. Include written certification that the manufacturer has at least three years of experience in designing and manufacturing modular expansion joints. Include the location of each bridge, installation date, governmental agency/owner and the name, address and phone number of the owner’s representative. Include the manufacturer’s AISC certifications.

2) Fatigue Testing. Provide a modular joint system that has been tested and designed in accordance with the guidelines provided in the National Cooperative Highway Research Program (NCHRP), Report 402 “Fatigue Design of Modular Bridge Expansion Joints” as well as the Chapter 14 of the AASHTO LRFD Bridge Design Specifications. Submit full

specimen life cycle fatigue test report done by a nationally recognized independent testing laboratory to the Project Manager for approval at least 60 days prior to installation.

3) Shop Drawings and Design Calculations. Provide calculations and shop plans in accordance with other contract requirements. The shop plans and calculations must bear the stamp and signature of a Professional Engineer licensed to practice in Montana. Include the following information as a minimum:

a) Plans, elevations and sections of the joint system.

b) Complete details of all components and sections showing all materials incorporated in the expansion joint system including all bolted and welded splices and connections.

c) Details and material designations pertinent to the corrosion protection system.

d) Installation plan including sequence, lifting mechanisms and locations, details of temporary anchorages during setting, temperature adjustment devices, opening dimensions relative to temperature, details for installation at curbs and seal installation details.

e) Include the qualifications or the manufacture's Installation Technician that will be available during installation of the joint system. The Installation Technician provides written certification that the joint system was installed in accordance with the manufacturer's instructions.

f) Plan for achieving water tightness including details related to performing the water tightness test as required elsewhere in this provision.

g) Requirements related to the temporary support of the modular joint system for shipping, handling and job site storage.

h) Design calculations for all structural elements including springs and bearings. Include fatigue design for all structural elements, connections and splices.

i) Welding procedures in compliance with the current AASHTO/AWS D1.5 Bridge Welding Code

j) A written maintenance plan and part replacement plan to facilitate replacement of parts subject to wear. Include a list of parts, instructions for maintenance inspection, acceptable wear tolerances and methods for determining wear, procedures for replacing worn parts, and procedures for replacing seals.

k) Any required modifications to the plans needed to accommodate the modular expansion joint.

4) Certificates of Compliance. Submit with the shop plans the following certifications.

a) Manufacturer's AISC Quality Certification

b) Documentation that welding inspection personnel are qualified and certified as welding inspectors under AWS QC1, Standard for Qualification and Certification of Welding Inspectors.

c) Documentation that personnel performing nondestructive testing (NDT) are qualified and certified as NDT Level II under the American Society for Nondestructive Testing (ASNT) Recommended Practice SNT-TC-1a.

5) Prior to fabrication submit for approval the following test reports and certificates of compliance:

a) Manufacturer's certificate of compliance for all PTFE sheeting, PTFE fabric, elastomers and epoxy binder.

b) Certified mill test reports for all steel and stainless steel in the expansion joint assemblies.

c) Certified test reports confirming that the springs and bearings meet the design load requirements.

6) Warranty. Provide a five year written guarantee for the operation and durability of the modular expansion joint. Broken welds, cracks in the steel members, fatigue, loss of precompression in the springs or bearings, debonded PTFE, breakdown of the corrosion

protection, and leakage constitutes unsatisfactory operation and durability of the system. Cover under the guarantee replacement or repair of any joint parts within the first five years, commencing from the actual completion date of the Contract in accordance with the Standard Specifications. Replace or repair any joint parts within the period of the guarantee at the Contractor's expense.

E. Construction Requirements.

1) Fabrication.

a) Certified Manufacturer. Fabrication of the joint system by the manufacturer holding the required certifications is required.

b) Shop Welded Connections. Provide full penetration weldments for splices in horizontal center beams and edge beams. Provide full penetration weldments in all center beam to support bar connections.

c) Support Box Construction. Minimum plate thickness for support box construction is 3/8" thick. Provide continuous welds to connect plates forming the support box. Caulking is not permitted. Affix the upper and lower support bar bearings in a stationary position within the box and provide a bonded Teflon finish at the stainless steel sliding surface of the support bar.

d) PTFE Sliding Surface. Construct the PTFE surface smooth and free of bubbles in accordance with the instructions from the manufacturer.

e) Stainless Steel Sliding Surface. Polish the stainless steel sliding surface as specified in ASTM A480 to a No. 8 mirror finish. Seal weld all around the stainless steel sheet to the steel backing plate by the tungsten-arc welding process in accordance with the current AWS specifications. Clamp down the stainless steel sheet to have full contact with the steel backing plate during welding. Do not allow welds to protrude beyond the sliding surface of the stainless steel.

f) Corrosion Protection. Protect all steel surfaces, except surfaces under the stainless steel or those to be bonded to PTFE or those in direct contact with the seal, against corrosion by hot-dip galvanizing in accordance with the requirements of AASHTO M111

2) Shipping and Handling.

a) Deliver and store the joint system on site in accordance with the manufacturer's instructions and as approved on the shop plans.

b) Do not install lifting mechanisms or other temporary appurtenances on the center beams or edge beams.

c) Damage to the joint system due to improper shipping and handling is just cause for rejection of the joint system. Repair damage to the corrosion system per the manufacturer's instructions and as approved by the Project Manager.

3) Installation.

a) Install the joint assembly in accordance with the manufacturer's instructions. Have available, the services of a qualified installation technician from the manufacturer to assist with the installation. Provide the written instructions from the manufacturer and installation technician to the Project Manager two weeks prior to installing the joint system. Provide written certification signed by the manufacturer's installation technician that the joint assembly was installed per the manufacturer's instructions.

b) Install the joint to provide a gap corresponding to the ambient temperature at the time of installation.

c) Install the joint assembly to match the finished roadway profile and grades shown on the plans. Recess the joint rails 1/4" below the finished grade. Survey the joint to confirm the installation is at the correct elevations prior to placing concrete in the blockout.

d) Replace elements with unintended bends or kinks at the Contractor's expense. Straightening of bends or kinks is not permitted.

e) Take precautions to prevent damage to the joint during construction operations. Do not allow construction loads on the joint after installation. Provide a positive means of

bridging over the joint to allow passage of construction traffic as approved by the Project Manager.

f) Clean and remove all formwork, temporary appurtenances, and debris as a result of the installation and that may impede movement of the joint.

g) Water test. Test the expansion joint system for water tightness after installation. Flood the joint for a minimum of one hour to a minimum depth of 3 inches. If leakage is observed, repair the joint system at the Contactor's expense. Use repair procedures provided by the manufacturer and as approved by the Project Manager. Any seeping water through the joint is cause for rejection of the expansion device.

h) Final Inspection. The Department will inspect the expansion joint upon arrival at the job site and prior to installation. The Department will inspect the joint system for proper alignment, complete bond between the neoprene seals and the steel, and proper stud placement and effectiveness. Provide clean and dry access to the areas needed for inspection. Replace all work that does not meet the requirements of the plans and manufacturer's instructions to the satisfaction of the Project Manager. Replace any studs that are not installed within 1 inch of the location depicted on the shop plans, do not have complete end welds, or do not emit a ringing sound when struck with a light hammer blow. Repair or replace expansion joints that fail inspection to the satisfaction of the Project Manager. Submit any proposed corrective action to the Project Manager for approval prior to beginning corrective work.

F. Method of Measurement. Modular expansion joints are measured per linear foot for each joint size and location, furnished and installed, measured parallel to the plane of the finished joint surface along the centerline of joint between the limits shown on the plans.

G. Basis of Payment. Payment for Expansion Joint – Modular includes all costs associated with designing, furnishing, testing, and installing the joint system and concrete within the deck blockout in accordance with the plans and this provision.

39. PAINT EXISTING STRUCTURE

A. Description. Furnish all materials, and resources to clean, repair pack rust, and paint the existing steel girders, stringers, floor truss/beams, bearings, and other steel elements within 5' of each existing deck or expansion joint as well as the top flange of the stringers in locations noted on the plans and as directed by the Project Manager. The quantity shown on the plans is for bidding purposes and may vary depending on conditions discovered in the field. Use an existing paint overcoat system in accordance with the Standard Specifications and as specified herein.

B. Materials

1) Paint. Provide a compatible surface coating per the standard specifications that is intended to be used over existing paint and capable of being applied in various weather conditions including cold and/or damp conditions.

2) Pack Rust Repair.

a) Epoxy Penetrating Sealer. Use one of the following or an approved equal:

(1) Rustbond Penetrating Sealer, as manufactured by the Carboline Company, St. Louis MO

(2) Amerlock Sealer as manufactured by PPG, Montvale NJ

(3) MACROPOXY 920 Pre-Prime as manufactured by The Sherwin Williams Company, Cleveland OH

b) Polyurethane Sealant. Use a sealant meeting the requirements of ASTM C920, Type S, Grade NS, Class 50

c) Preformed, closed-cell foam material meeting the requirements of the table below:

Property	Test Method	Specification	
		Minimum	Maximum
Extrusion	ASTM D545 @ 50% Compression 3 Sides Restrained	-	1/4 inch
Compression Deflection	ASTM D3575, Suffix D 50% Deflection @ 80° F	10 psi	60 psi
Density	ASTM D3575, Suffix W, Method A	2 pcf	3 pcf
Water Absorption	ASTM D545	-	3%
Compression Set	ASTM D1056, 50% Deflection for 22 hrs. @ 70 ± 5° F	-	15% @ 168 hrs.

C. Submittals. Per the Standard Specifications and as specified below.

1) Sequence of operations. Submit the proposed sequence of painting operations along with task durations. Identify operations that impact traffic. Indicate where materials and equipment are staged and how they are delivered to and from the scaffolding.

2) Containment System. Contain and dispose of lead based paint as described elsewhere in the contract. Submit the proposed containment system details along with written description of how loose and removed paint will be contained and disposed.

3) Existing Paint Testing. Submit a proposed sampling and testing plan that will be used to show that the proposed overcoat paint is compatible with the existing paint. Include the number and size of samples provided as well as the tests that will be performed to ensure compatibility. Upon approval of the sampling and testing plan, sample the existing paint, test, and provide the test results with certification that the proposed paint system is compatible with the existing paint.

4) Pack Rust Repair. Submit for approval, the proposed methods to remove pack rust, dry the repair area, and proposed sealants with manufacturer's instructions.

D. Construction Requirements.

1) Provide an existing paint overcoat system compatible with the existing paint

2) Provide a finish coat that matches the existing steel color.

3) Surface Preparation. Prepare the existing steel surface in accordance with the Standard Specifications and the paint system manufacturer's recommendations.

4) Pack Rust Repair. Repair areas subject to pack rust where the existing built up steel is deformed by 3/8" or more due to pack rust and as identified by the Project Manager. Use the following repair procedures unless otherwise approved by the Project Manager.

a) Notify the Project Manager of locations not identified on the Plans where built-up steel sections are deformed over 3/8" due to pack rust. Repair these areas as directed by the Project Manager.

b) Do not remove existing fasteners and/or disassemble built-up members to remove pack rust.

c) Remove the existing paint in the areas of pack rust removal per the requirements in the Standard Specifications.

d) Remove the pack rust in the deformed area by power tool cleaning to a depth equal to the separation distance between the plies but not less than one-half inch.

e) Pressure washing between steel plies where pack rust is present is prohibited

f) With the pack rust removed, dry the repair area by applying artificial heat until the surface temperature reaches 250° F.

g) Immediately after the surface has been dried, saturate the repair area by applying an epoxy penetrating sealer (sealer). Apply the sealer in accordance with the manufacturer instructions.

h) Encapsulate (caulk) the exposed surface and edges of the repair area with a closed cell foam material and polyurethane sealant. Before encapsulating ensure the area is free of dirt, dust, rust, loose paint and any other material that would interfere with the adhesion of the closed cell foam material. Fill areas of pack rust repair flush with the vertical edges of steel flanges and without voids or air pockets. Apply closed cell foam and polyurethane sealant in accordance with the manufacturer's instructions.

E. Measurement and Payment. Include all costs associated with designing, installing and removing the containment system, surface preparation, pack rust repair, collection and disposal of existing paint, and painting of the existing steel in the unit price bid for Paint Existing Structural Steel.

40. SUPERSTRUCTURE JACKING

A. Description. Furnish all materials, labor and equipment necessary to raise and lower the existing superstructure in order to facilitate bearing replacement at the following locations: Bent No. 2, Pier No. 3, Pier No. 6, and Bent No. 7. Utilize two jacks at each location to jack between the floor beam ends and the bent/pier caps. Provide design for any temporary structures used to support the jacks and bridge.

B. Materials and Equipment. Provide jack system, PTFE sheets and other temporary structures or methods to safely lift and support the superstructure for the duration of the work.

1) Jack System. Use hydraulic jacks, hydraulic pumps, and hydraulic control system capable of allowing tandem operation. Provide hydraulic jacks with lock nut, or provide temporary shoring, to hold the superstructure in the raised position in the event of a loss of hydraulic fluid pressure.

2) Polytetrafluoroethylene (PTFE) Sheets. Provide lubricated sheets of PTFE that extend for the full plan dimensions of the larger of the top bearing plate or the bottom flange of the girder, are capable of resisting the bearing pressure due to the jacking and with a lubrication meeting SAE – AS8660.

C. Jacking Loads. Refer to the plans for estimated structure weights at the proposed jack locations.

D. Submittals.

1) Jacking Plan. Submit for review a minimum of 30 calendar days before performing superstructure jacking a jacking plan which includes the sequence of jacking operations, the anticipated total time for the jacking operation and bearing replacement, list of proposed equipment used to perform the work as well as any shoring details and timber or steel blocking.

2) Jack System. Provide manufacturer cut sheets for Safe Working Loads and Ultimate Loads for the jacking system. Include the system's maximum rated pressure, as well as the proposed location of pressure gauges that will be used to monitor the system.

3) Provide Calculations stamped by a licensed Montana Professional Engineer showing the ultimate and safe working capacities for any custom shoring, bracing or blocking used.

E. Construction Requirements

1) The superstructure jacking and bearing replacement are a continuous activity. Keep the time the superstructure is supported on jacks to the minimum necessary to replace the bearings. Have bearing units ready for installation prior to commencing superstructure jacking.

2) Raise and lower the superstructure uniformly at each bent to prevent differential displacement and damage to the existing girders or diaphragms/bracing. Provide the necessary hydraulic pressure gauges, displacement gauges or other appropriate devices to monitor the jacking operation. Repair any damage to the bridge caused by jacking at no cost to the State. The Contractor is responsible for the stability of the structure during the work.

3) Do not jack at multiple bents simultaneously. Complete the jacking operation at one bent before commencing jacking at the other bent.

4) Jack Location. Center jack under floor beam jacking stiffeners as detailed in the contract plans. Use two jacks per floor beam and place them between the pier/bent cap and the floor beam jacking plate. Use shims and bearing plates as required to provide uniform contact between the bent/pier cap, the jack, and the girder bottom flange

5) Thermal Expansion. Allow for longitudinal thermal movement of the span, while the superstructure is supported on jacks by placing two sheets of lubricated PTFE between the bottom flange and the top bearing plate. Alternative methods may be submitted for approval by the Project Manager.

6) Raise the superstructure as required to replace the bearings, but not more than 1". Estimated service member dead loads are provided elsewhere in this special provision. Provide gauged or other approved means to indicate jacking forces. Monitor jacking forces during the work and immediately notify the Project Manager if jacking forces exceed 125% of the member dead load service values listed above.

7) Sequence of Operations. Refer to the plans for a possible sequence of operations and other requirements.

F. Method of Measurement. All temporary structures, temporary bracing, hydraulic jacks, associated design, and other incidentals needed to raise and lower the superstructure are not measured for payment. New bearing assemblies including new sole plates, risers, masonry plates, elastomeric pads, threaded rods and associated hardware as well as any field welding of the existing superstructure to the new bearing is considered incidental to the unit Bid Item Elastomeric Bearing Device.

G. Basis of Payment. Include all costs associated with raising and lower the superstructure, including the installation of temporary shoring, shims or other hardware in the lump sum bid for Superstructure Jacking. Payment for the bearing assemblies including new sole plates, masonry plates, bearing blocks, elastomeric pads, as well as threaded rods and associated hardware is included in the unit price bid for Elastomeric Bearing Device.

41. APPROACH SPAN MODIFIED CONCRETE OVERLAY

Description. This provision applies to the method of measurement for the Class Deck concrete used for the approach span overlay. Rescind Standard Specification 552.04. Class Deck concrete used for the approach span overlay will be measured in accordance with Standard Specification 563.04.

42. CONCRETE – CLASS JOINT

A. Description. This work includes furnishing, forming, placing, and curing concrete to splice adjacent precast concrete deck panels in the field.

B. Materials. Design and produce concrete in accordance with the following table:

Class Joint Concrete Requirements	
Nominal Maximum Aggregate Size inches	½
Cementitious Materials Content, lbs./yd^3	658 max
Minimum Required Compressive Strength 28-Day, PSI	6000
Water / Cement Ratio (W/C)	0.40 max
Maximum Target Value for Slump, inches [2]	21
SlumpTolerance, inches	+3 to -3
Required Air Content, (%) [7]	4.5-7.5

C. Construction Requirements.

1) Submittals. Submit the proposed mix design for approval in accordance with Section 551.

a) Include in the mix design shrinkage test results in accordance with AASHTO T 160. The maximum allowed shrinkage for mix design acceptance is 0.0350% at 28-days.

b) Include in the mix design surface resistivity test results in accordance with AASHTO T 358 greater than greater than 15 kiliohm-centimeters at 28-day.

2) Panel Mockup. Construct a mockup to simulate conditions for placing and curing the field joint concrete. Refer to special provision *Precast Concrete Deck Panels* for additional requirements on the mockup. If necessary, modify operations and/or the mix design as approved by the Project Manager to successfully cast and cure the mockup field joints.

3) Sequencing. Place and cure field joint concrete in accordance with the requirements shown on the plans and as approved by the Project Manager. Cast all field joints within a segment for each approved sequence in a continuous manner. Do not place any construction live load, other than foot traffic, within that segment of field joints until the field joint concrete has reached 75% of the design strength.

4) Replace or repair cracked joint concrete or where the joint concrete has separated from the adjacent precast element as directed by the Project Manager. Cracks not exceeding 0.012 inches in width are considered acceptable.

5) Surface Finish. Provide an intentionally roughened finish (1/4” amplitude) on the top surface of the field joint to match the texture of the adjacent deck panel surface.

6) Testing and acceptance of Class Joint Concrete will be in accordance with Class Deck Concrete as defined in Subsection 551.03.8 with the following alterations:

a) A lot will be defined as a single day’s placement or every 30 yards.

b) Strength specimens and permeability specimens will be cast from each load of delivered Class Joint Concrete. Each delivered load will be evaluated for fresh properties including air content, slump, unit weight and temperature or as approved by Project Manager.

c) Pay factor for strength is not applicable. The Department will require removal and replacement or corrective action for any concrete which does not meet required compressive strengths.

D. Method of Measurement and Basis of Payment. Concrete Class Joint is measured and paid for in accordance with Subsections 551.04 and 551.05. Include all costs associated with performing the mockup in the unit price bid for Precast Concrete Deck Panel.

43. <u>BRIDGE DRAINAGE STRUCTURE</u>

A. Description. Supply and install deck scupper drains, connections/fittings, drain pipe, supports and all incidentals as shown on the plans and described in this provision.

B. Materials.

1) Structural Steel. Furnish structural steel in accordance with the Standard Specifications. Provide galvanization in accordance with the Standard Specification

Use galvanized steel for all steel.

2) Fasteners.

Furnish galvanized threaded rods, bolts, washers, and nuts in accordance with the Standard Specifications and as required by the design.

3) Scupper Grating. Furnish removable slotted iron grates or galvanized steel grating meeting:

a) Galvanized steel grating

(1) Provided welded steel grating

(2) Provide minimum bearing bar thickness of 1/4 inch

(3) Load banding

(a) Provide load banding at ends of bearing bars

(b) Provide load banding that is 1/4 inch to 1/2 inch lower than tops of bearing bars to promote drainage.

(4) Provide welded lugs to connect to the scupper assembly

b) Iron Grates meeting AASHTO M306 and able to be positively connected to the scupper drains.

c) The minimum required open area as shown on the Contract Plans

d) The geometry shown on the Contract Plans.

4) Scupper Drains.

Furnish scupper body composed of Fiber Reinforced Polymer meeting the requirements elsewhere in this special provision. Furnish a scupper body meeting the geometric requirements shown on the Contract Plans.

5) Fiber Reinforced Polymer (FRP). Furnish all drainage components identified as FRP including scupper drain bodies, with:

a) For Scupper Drains. Manufacture from polyester fiberglass that has a minimum wall thickness of 1/8 inch, is frost proof, salt proof per ASTM B117, is resistant to both acid and alkali solutions, and meets the following the minimum properties.

Compressive Strength	24,400 psi
Flexural Strength	9,943 psi
Water Absorption	0.33%

b) Joint Adhesive. Use adhesive bonded joints. Butt and wrap, or stab-in joints are not permitted. Use an adhesive able to safely bond to both the FRP scupper drain and the PVC drain pipe. Use an adhesive composed of a vinyl ester resin with silica filler, polyester pigment and methyl ethyl ketone peroxide catalyst. Provide certification that the adhesive is suitable for intended application and that resin does not contain additives that leach out, catalysts that remain active or ingredients that lead to early deterioration.

6) Polyvinyl Chloride (PVC) Pipe. Furnish fittings to the scupper drain and drain pipe as shown on the Contract Plans with Schedule 80 PVC pipe rated for continuous UV exposure and meeting the material requirements of Standard Specification Section 708.05.

7) Adhesive Anchor System. Provide adhesive anchor system per the Adhesive Anchor System Special Provision.

C. Submittals. Submit to the Project Manager for approval the following items.

1) Shop Plans. Include shop plans detailing the deck drainage inlets, fittings, connections, and support system. Match FRP color to the color of the PVC drain pipe. Include color chip samples for the finished color of the FRP as well as the PVC pipe and fittings. Provide material designations, manufacturer's recommendations and installation instructions.

2) Material Certifications. Submit material designations and certified test reports or certificates of conformance furnished by the manufacturer's testing laboratory or independent testing agency attesting that the materials meet the project requirements.

3) Adhesive Anchor System. See Adhesive Anchor System Special Provision for requirements.

D. Design Requirements

1) Design Loads.

a) Design grate, frame and scupper body to resist all dead loads as well as an HS25 Wheel Load + Impact.

b) Provide adhesive anchor system with an anchor group capable of providing a concurrent safe working load of 1000 pounds in shear and 500 pounds in tension.

E. Construction Requirements

1) Scupper Drains. Set the deck drains true and plumb and to the lines and grades shown on the plans prior to placing deck concrete.

2) Pipe Installation. Handle and install the pipe, drains, and fittings in accordance with the manufacturer's instructions.

3) Adhesive Anchor System. See Adhesive Anchor System Special Provision for requirements.

F. Method of Measurement. Measurement for the bridge drainage system will be per each deck scupper drain and includes the deck scupper drain and all associated drain pipe, fittings/connections, support elements, and other incidentals.

G. Basis of Payment. Include all costs associated with designing, furnishing and constructing the bridge drainage structure in the unit price for Scupper.

44. EXISTING STEEL STRINGER REPAIR

A. Description. After removing the existing concrete deck, inspect the existing 18-in deep wide flange stringers located between the two main steel girders. If necessary, repair the stringers per the details shown on the plans and as directed by the Project Manager.

B. Materials. Use galvanized or painted structural steel meeting the requirements of the Standard Specifications for AASTHO M270 Grade 50. Use galvanized high strength bolts meeting the requirements of ASTM A325.

C. Construction Requirements.

1) Inspect the existing stringer top flanges after removing the concrete deck. Stringer repair or replacement may be required under the following circumstances:

a) Less than or equal to 35% Section Loss – Clean and paint.

b) 35% < Section Loss < 55% - Cover plate repair as shown in the plans.

c) Greater than 55% Section Loss – Replace the stringer.

2) Mark the limits of section loss per the criteria above and notify the Project Manager. The Project Manager will coordinate with the designer to determine if repair is necessary. Where there is loss of paint or section loss up to 35%, clean and paint the top flange. Where section loss exceeds 35%, repair method a) or b) noted above may be required depending on the location. The Project Manager will provide direction on whether or not repair method a) or b) is necessary.

D. Measurement and Payment. Inspection of the existing steel stringer top flanges is not measured for payment and considered incidental to other items. Cleaning and painting the top flange of the stringers is included for payment in the Paint Existing Structural Steel item. For estimating purposes, 50% of the total length of existing stringer top flanges, in addition to the area of stringers requiring painting at existing deck joints, has been included in the plan quantities. Costs for furnishing materials and performing the cover plate repair or replacing stringers is included for payment in the CMG Contingency Work item.

45. PRECAST DECK PANELS

A. Description. Furnish and install precast concrete deck panels in accordance with Section 553 and 554 of the Standard Specifications and the additional requirements of this provision.

B. Materials.

1) Concrete. Use hydraulic cement concrete meeting the requirements of Class-PRE as defined in Section 551 of the Standard Specifications. Additional requirements:

a) Provide concrete with a final design strength (f`c) of 6000-psi.

b) Required air content: 5.5%-8.5%

An approved mix design is required prior to fabrication.

2) Reinforcing Steel. Use ASTM A1035/A1035M Grade 100 Corrosion Resistant reinforcement. Refer to other requirements for Corrosion Resistant Reinforcing Steel included in these Special Provisions.

3) Leveling Inserts. Provide leveling inserts per the Standard Specifications or other approved materials and means to set the panels to the specified alignment and grade.

4) Structural Grout. Provide a premixed non-shrink structural cement grout to fill stud pockets and girder haunches. Furnish cementitious materials and aggregates in accordance with Section 551 of the Standard Specifications. Provide a grout that bonds to the adjacent concrete and with a durability equal to or greater than the connected components. Use cementitious grout without calcium chloride or admixtures containing calcium chloride or other ingredients in sufficient quantity to cause corrosion to steel. The material must be able to flow into confined joints and expand to fill larger pockets. Additionally:

a) Provide a minimum compressive strength of 6000-psi in accordance with AASHTO T22 or AASHTO T106.

b) High early strength gain to accommodate the proposed sequencing with a minimum 24-hour compressive strength of 5000-psi.

c) Maximum coarse aggregate size of 3/8”

d) Restrained shrinkage in accordance with AASHTO T334 (Ring Test) with the specimen exhibiting no cracking in 4-days.

e) Minimum bond strength of 1000-psi in accordance with ASTM C1583.

f) Minimum durability factor of 80% in accordance with AASHTO T161.

g) Maximum rapid chloride permeability value of 1500-coulombs at 56-days in accordance with AASTHO T277.

C. Submittals.

1) Plant Certification. Fabricate precast deck panels using a manufacturing plant currently certified by the Prestressed Concrete Institute or the National Precast Concrete Association. Section 553.03.1 of the Standard Specifications applies.

2) Shop Plans. Submit detailed shop plans for approval in accordance with Section 553.03.2. Include details showing placement of reinforcing steel, embedded components, levelling bolts, and lifting devices. Provide details and marks for each unique panel. Panel details as shown in the plans may be modified to facilitate fabrication and erection as approved by the Project Manager. Any proposed changes to the details shown in the plans require approval from the Project Manager. Provide an erection plan showing the locations of individual panels to be installed in the field.

3) Design Calculations. Design lifting devices to adequately support and transport the panels to prevent damage. Design a levelling system consisting of embedded bolts or other means. Design lifting devices and temporary supports during transport to limit potential crack widths to not exceed 0.012-in. Provide calculations to determine the theoretical crack width under these load conditions in accordance with AASHTO considering the Service Limit State or other approved method. Include design calculations and details signed and sealed by a Professional Engineer licensed in Montana demonstrating compliance with this provision.

4) Panel Fabrication. Submit the proposed sequence of operations for casting, finishing, and curing the panels in the shop.

5) Panel Erection Sequence. Include the sequence for setting panels to the proper alignment and grade, method for grouting stud pockets and haunch, and for placing and curing field joints. Unless otherwise approved by the Project Manager, set panels on the bridge following the requirements shown on the plans.

6) Structural Grout. Submit the proposed product information including, manufacturer information, product data sheet, material safety sheets, supporting test data from an independent lab demonstrating compliance with this provision, and at least 3 example highway bridge projects where the material was used successfully in a similar application within the last 5-years. Also include the manufacturer’s requirements for mixing and placing the structural grout.

7) Quality Control. Provide a quality control process to ensure proper fabrication and fit-up in the field. Submit the proposed quality control plan for approval prior to fabricating the panels.

D. Construction Requirements.

1) Precast Deck Panel Tolerances. Meet the tolerances shown in Standard Specifications Table 553-1 and as listed below:

Dimensions (length and width of panel)	+ 1/4 in, - 1/4 in
Diagonal alignment (measured corner to corner)	+ 1/4 in, - 3/8 in
Warp (During storage when laid flat, the difference in elevation of one corner compared to any of the other three)	+/- 1/4 in (vertical) per 8-ft (horizontal)
Deck form elevation	+1/8 in, -1/4 in
Deck thickness	+1/4 in, -1/8 in
Deck smoothness (parallel to roadway centerline)	±3/16 in per 10-ft

2) Panel Mockup. Construct a minimum of two mockup panels to verify workmanship and fit-up. Provide the Project Manger the schedule and details for fabricating mockup panels a minimum of 2-weeks in advance. Do not begin casting mockup panels until approved by the Project Manager. After casting the panels, lift and set the mockup panels on elevated supports that match the size and spacing of the actual girders on the bridge. Set the elevation of the supports so that the bottom of the panel is approximately 4-ft above ground or as otherwise approved to allow the top and underside of the panels to be visible and easily accessed by inspection personnel. Test the leveling devices to verify they will function correctly in the field. Form girder haunches below the mockup panels to simulate actual haunch geometry and conditions in the field. Test grout installation procedures in the stud pockets and determine flowability into the girder haunches. Once the haunch concrete has hardened, strip the haunch forms and review for adequate flowability and coverage. Modify the grouting process and/or mix as necessary and as approved by the Project Manager to provide adequate flow and fill of the girder haunches. Seal the field joint between the adjacent panels to prevent leaking, place the additional reinforcing steel and cast the field joint. Do not begin production of the precast deck panels until two mockup panels have been successfully cast and spliced as approved by the Project Manager. Construct additional mockup panels as directed by the Project Manager to demonstrate any previous deficiencies have been corrected.

3) Surface Finish. Provide an ordinary finish on the vertical and bottom surfaces of the deck panels in accordance with the Standard Specifications. Provide an intentionally roughened surface with ¼” amplitude on the top surface of the panel or as approved by the Project Manager to ensure bonding with the modified concrete overlay in accordance with Section 563.03.3.

4) Lifting and Transport. Limit stresses in the panels during handling and transport to reduce cracking and prevent damage. Do not lift the panels until the concrete has reached a minimum strength of 4,000-psi. Do not transport panels to the job site until the concrete has reached the full design strength. Replace any panels that have been damaged or have excessive cracks or defects at no cost to the State.

5) Major Defects. Major defects include surface spalls or honeycombing with a dimension greater than ¼-in deep and with a horizontal dimension greater than 12-in, exposed reinforcing, cracks that extend full depth of the panel or cracks that are greater than 0.012-in wide. Major defects may not be repaired without approval by the Project Manager. Replace panels that cannot be repaired to the satisfaction of the Project Manager. Replace any panel with major surface defects or cracks that are consistent over 10% or more of the surface area.

6) Setting Panels. Brace the existing steel stringers and girders as necessary to prevent lateral displacement and to properly align the panels on structure. Set panels on the

steel stringers to the alignment and grade specified on the plans. Provide proper distribution of panel weight to the supporting elements. Correct any misalignment of reinforcing steel and provide the minimum splice lengths shown on the plans. Obtain approval from the Project Manager prior to placing field joints or grouting stud pockets or haunches.

7) Structural Grout. Form the girder haunches and seal field joints to prevent leaking during placement of grout. Mix and place the grout per the manufacturer's requirements and as approved based on the results of the mockup test. Keep the bonding surfaces free from laitance, dirt, dust, grease, oil or other contaminates that adversely affects the bond and cure of the grout. Place the grout uphill, in a continuous manner for each panel. Completely fill the stud pockets and haunch such that there are no voids. Grout all surface voids for lifting devices, leveling bolts, and grout ports. Texture the exposed top surface of the grout blockouts to match the concrete panel surface. Cure the grout in accordance with the manufacturer's recommendations. Do not apply superimposed dead load or construction live loads to the concrete deck panels until the structural grout has reached a minimum strength of 1000-psi or as required by the manufacturer. Finish the grout flush with the deck panel surface or a maximum of 1/8" higher than the panel surface. Once the grout has reached the 24-hour compressive strength, remove the levelling bolts and grout the levelling bolt blockout.

8) Field Joints. Follow the plans and the approved sequence of operations for setting panels, grouting the stud pockets and haunches, and casting field joints. Refer to the project special provision *Concrete – Class Joint* for additional requirements. Refer to other requirements of the contract for placing concrete in the field joints.

9) Deck Panel Surface Treatment. Do not seal the deck panel surface as specified in 553.03.19D of the Standard Specifications. Prepare the deck panels and field joint surface for the Modified Concrete Overlay per Section 563 of the Standard Specifications.

E. Method of Measurement. Precast Deck Panels are measured per the Square Foot of horizontal plan area shown on the Plans excluding the plan area of full depth closure pours.

F. Basis of Payment. Include all costs associated with panel fabrication (forming, reinforcing steel, lifting devices, levelling hardware, other incidentals, casting, and curing), mockup panels, shipping, erecting, and grouting the haunch and stud pockets in the unit price bid for Precast Deck Panels. Furnishing and placing reinforcing steel and cast in place concrete in the field joints is measured and paid for separately.

46. CONSTRUCTION EQUIPMENT ON STRUCTURES (REVISED 7-15-19)

A. Description: Requirements associated with the operation of equipment on structures.

B. Definition. The following definition applies to this special provision:

Equipment. Any vehicle or machine weighing more than 5000 pounds.

C. Construction Requirements. Do not use bridges as work platforms, work bridges, or to support or move equipment without the Project Manager's written approval. The Project Manager may require a full Engineering Submittal at their sole discretion.

1) For bridges having no posted load restrictions and no removal of deck concrete (not milled), submit a full Engineering submittal for approval for all equipment utilizing outriggers on the structure and for any equipment not already approved under one of the following conditions:

a) Legal Loads. A vehicle that is a legal load as defined by Montana Code Annotated (MCA).

b) Pre-Approved Equipment. The equipment is currently listed on MDT's Approved Construction Equipment List (ACEL) and will be operated according to any conditions stated in the ACEL.

2) For bridges with a posted load restriction or if bridge deck concrete is partially milled or removed, submit a full Engineering submittal for approval for any of the following cases:

a) Equipment weight exceeds 25 tons.

b) Vehicle weight and configuration does not satisfy the posted load restriction.

c) More than one piece of equipment will be simultaneously located on a span.

d) Concrete removal results in debonding of the top mat of deck reinforcing steel.

e) Repairs to bridge beams or truss members are specified in the contract and repairs are not complete.

f) Equipment outriggers will be used.

3) Full Engineering Submittal requirements. Submit an engineering analysis and report performed by an engineer registered in Montana.

Engineering analysis. Clearly describe loading conditions, assumptions, and provide calculations. Investigate an envelope within which the equipment may function without damaging the structure or endangering workers or the public. MDT proposes the following topics, at a minimum. Provide additional information when necessary.

a) Load Cases.

(1) Minimum suggested live load vehicles are Type 3 and Type 3S2 trucks in live load combinations from AASHTO "Manual for Condition Evaluation of Bridges."

(2) Consider all loads on the bridge including axle loads, outriggers, equipment dynamic forces, and wind forces on the load, the boom, and the equipment. Consider deflection and secondary force effects. Include traffic live load if the structure will carry traffic during equipment operations.

(3) Investigate different loading combinations for all configurations. Include the distribution of dead load and changing center-of-gravity of the equipment with and without load at different boom extensions, rotations, and elevations.

b) Structural Effects. Identify critical members. Determine any conditions under which the equipment cannot safely operate.

c) Written Report. Provide a report containing a narrative summarizing the results of the analysis. Describe special measures necessary to protect the structure through all phases of the equipment's positioning and use. Include drawings as necessary and indicate any minimum equipment clearances to relevant portions of the structure and to traffic flow. Estimate the work's duration.

d) MDT will consider equipment submitted under this contract for addition to the ACEL.

D. Method of Measurement. Work associated with this provision is not measured for payment.

E. Basis of Payment. Include all costs associated with the requirements of this provision in the cost of other items.

47. MASH GUARDRAIL [606] (ADDED 1-18-18)

Use one of the MASH tested W-Beam terminal sections listed on the Department’s QPL.

48. IMPACT ATTENUATOR – TEMPORARY [606] (REVISED 2-28-13)

A. Description. This work is furnishing, installation, maintenance, and removal of temporary impact attenuator and crash cushion devices when construction activities expose blunt ends, ends of barriers, fixed objects, or other obstacles within the clear zone.

B. Materials. Furnish devices, including required transition sections that meet the National Cooperative Highway Research Program Test Report 350 (NCHRP 350) or the AASHTO Manual for Assessing Safety Hardware (MASH) crash test requirements.

C. Construction Requirements. Submit the manufacturer's installation instructions and proof of NCHRP 350 or MASH compliance 14 calendar days prior to any work that will require the installation of devices.

Install devices at the locations shown of blunt or exposed ends of barriers or fixed objects in accordance with the manufacturer's installation instructions. The device must be installed within 12 hours from the time the obstacle is exposed.

Maintain at least one complete set of repair parts on the project at all times to repair or replace attenuators, which may be damaged during construction.

Attach the impact attenuator to the concrete barrier rail or other fixed objects using the manufacturer's approved transition section. Follow all manufacturers' instructions and guidance during the installation. Furnish and install all transitions, mounting hardware, and other necessary items.

Repair or replace damaged attenuators within 12 hours.

Remove the device within 48 hours of when the obstacle no longer exists. The devices remain the property of the Contractor after completion of the project.

D. Method of Measurement. Temporary impact attenuators are measured for each complete installation shown on the plans. Installations required by the Contractor's operations and not shown on plans or the repair or replacement of temporary impact attenuators damaged by the Contractor will not be measured for payment. Removal and replacement of planned installations damaged by traffic will be measured for payment.

E. Basis of Payment. Payment for the completed and accepted quantities is made under the following:

PAY ITEM	PAY UNIT
Temp Impact Attenuator	Each
Reset Impact Attenuator – Temporary	Each

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the contract.

49. OPTIONAL ROUND WOOD GUARDRAIL POSTS [606] (REVISED 9-05-19)

Round wood posts with concave blockouts did not pass MASH testing. Subsequently, the optional round wood post mounting detail shown in Detail Drawing 606-05A is rescinded.

50. REVEGETATION

A. Description. This work consists of providing the necessary equipment and materials to accomplish revegetation of ground disturbed by construction activities, and/or as directed by the Project Manager.

B. Construction Requirements. Salvage and/or furnish sufficient quantities of topsoil to place 4 inches over disturbed areas. Immediately following construction activities, uniformly place the topsoil, condition seedbed and broadcast seed with the following seed mix and equivalent rates. Following broadcast seeding, scarify the areas to incorporate the seed into the upper ¼ to ½ inch of soil.

REVEGETATION TYPICAL			BROADCAST SEEDING RATE		
SCIENTIFIC NAME	COMMON NAME	VARIETY	Pounds PLS/ Acre	PLS/ sq.ft.	% of Mix
Elymus trachycaulum	Slender wheatgrass	Pryor, First Strike, Copperhead or Revenue	4.0	13	13
Elymus lanceolatus spp. riparium	Streambank wheatgrass	Sodar	5.0	17	18
Pascopyrum Smithii	Western wheatgrass	Rosana or Recovery	5.0	11	11
Pseudoroegneria spicata	Bluebunch or Beardless wheatgrass	Goldar, P7, Anatone or Whitmar	7.0	22	22
Bromus marginatus	Mountain Brome	Bromar or Garnet	5.0	9	9
Poa secunda (P. ampla)	Big bluegrass	Sherman	1.0	20	20
Achillea millefolium	Western yarrow	Eagle or Great Northern	0.1	7	7
GRAND TOTAL			27.1	99	100

*Use individual substitute species only if the recommended species is not available and substitution is approved by MDT's Reclamation Specialist.

C. Basis of Payment. Topsoil salvage, replacement, soil conditioning and seeding are paid for as REVEGETATION at the lump sum contract unit price.

51. TRAFFIC CONTROL PLAN [108]

Provide traffic control in accordance with Section 618, Detailed Drawings, the Plans and the MUTCD. Submit a written traffic control plan a minimum of two weeks prior to any anticipated work. Proceed with operations only after obtaining the Project Manager's approval.

52. BLUE SLIDE TRAFFIC CONTROL

A. Description. Blue Slide Road will remain open during construction and serve as a restricted detour. Construct safety improvements on Blue Slide Road as directed by the Project Manager.

B. Estimated quantities for the proposed improvements are shown on the plans for bidding purposes. Actual quantities and locations will be determined by the Project Manager.

C. Install traffic safety items prior to any lane closures on Highway 200. If necessary, maintain, or reinstall safety elements on Blue Slide Road as directed by the Project Manager.

D. Method of Measurement and Basis of Payment. Include all costs associated with installing and maintaining traffic safety elements on Blue Slide Road in the unit price bid for the respective items shown on the plans.

53. WATERWAY PASSAGE AND SIGNING

A. General. Provide and sign a passable waterway channel keeping waterway users always clear of potentially unsafe overhead construction activities during the bridge work.

B. Construction Requirements.

Maintain a minimum 40 ft-wide by 10 ft-high passable waterway channel at all times. Review the site with the Project Manager to determine the best placement of the openings considering channel depth, channel current, and overhead construction activities. The passable waterway channel must maintain a vertical clearance of 10 ft using hydrological data for the month having the highest flow elevation that the reduced passable channel must be in place. Monitor the 10 ft clearance daily and immediately adjust the location of the passable channel if rising water reduces the clearance to less than 10 ft.

C. Signing. Sign the waterway for the bridge work as follows.

Install 5 ½ ft x 3 ft "NAVIGATION RESTRICTION AHEAD" signs on both banks at approximately 500 feet and 1500 feet from the bridge on both the east and west sides of the structure. Attach two Type C Steady burn lights to the top corners of each sign. Place the signs at a point above the high-water level, or as directed, facing oncoming waterway users.

Contact the MDT Traffic Section, (406) 444-6222 Missoula for sign design calculations.

D. Channel Marker Buoys. Furnish and install hanging can or anchor buoys to delineate the waterway opening. Use buoys having the hazard-warning symbol with the "HAZARD AREA" message.

Follow the buoy manufacturer's installation recommendations. Consult with the Project Manager and determine a mutually agreeable date for installation, adjustment, and removal of buoys. Use buoys and channel markers following the U.S. Aids to Navigation (ATON) system. Contact the U.S. Coast Guard District Aids to Navigation office at (206) 220 – 7270.

1) Hanging Can Buoys. Use an aerial cable to suspend the hanging can buoys approximately two feet from the water's surface.

Flare the cables out from both sides of the falsework/bridge opening to both shorelines.

2) Surface Buoys. Lay and anchor the cables to the river/stream bottom for attaching the buoy mooring lines. Ensure the anchor cable is ballasted to prevent it from rising from the river/stream bottom. Flare the cable out from both sides of the falsework/bridge opening to both shorelines.

E. Bridge Opening Lighting. Install Type C Steady burn lights, spaced on maximum 3 ft centers, on the top and sides of the false work opening or bridge opening to be used by waterway users.

F. Public Notice. Submit at the preconstruction conference, one copy of the draft public notice for the Project Manager's approval. Once approved, place the notice in the nearest town newspaper and forward copies to local radio station(s) four weeks and two weeks before work restricts the waterway. Include the following in the notice: name of waterway and location of the bridge work, the dimensions of the waterway opening, the time period the restricted waterway opening is anticipated to be in place, and the phone number to call for additional information.

G. Method of Measurement and Basis of Payment. Waterway passage and signing is not measured for payment. Include the cost of this work in other contract items.

54. ADVISORY SIGNING

A. Description. This work includes placing and maintaining advisory signing at key decision points to advise the public of the bridge closure.

B. Materials. Provide materials meeting the requirements of the Standard Specifications.

C. Construction Requirements.

1) Obtain the necessary encroachment permits from the Idaho Transportation Department and the Washington State Department of Transportation.

2) Furnish and install single use signs and other incidentals at the locations shown in the Plans. Adjust the location of the signs to fit site conditions as necessary and as approved by the Project Manager.

3) Provide personnel responsible for surveillance and maintaining the advisory signing. Provide at least one person to be available 24-hours a day that can provide for the immediate repair or replacement of signs if necessary. Submit the name and phone number of the designated contact to the Project Manager.

D. Measurement and Payment. Include all costs associated with the installation, maintenance, and removal of advisory signs in the unit price bid for Single Use Signs.

55. CAMERA SYSTEM, INSTALL AND REMOVE [618] (REVISED 9-11-14)

A. Description. This work involves the installation, maintenance, removal and repacking of a Department-owned, solar powered, remote camera system. Additional information about the webcam may be accessed at the following link: ftp://ftp.mdt.mt.gov/contract/contractors/WEBCAMERA_INFO/

B. Materials. Furnish a 40-foot (12 m) machine peeled wood mounting pole with a minimum diameter of 10 inches, in good condition. Furnish a ⅝-inch by 8-foot (16 mm by 2.4 m) copper clad grounding rod, 45 feet (13.7 m) of #8 AWG solid copper ground wire and clamps. Furnish cable ties or clamps for securing cables and wire to the mounting pole.

C. Construction Requirements.

1) Delivery. The Department will furnish the camera system. The camera system includes the camera housing and contents, solar panel, battery, battery box, mounting brackets, cables, and associated hardware, except as noted under Materials.

The Project Manager will deliver the camera system to the project site. Coordinate delivery of the system with the Project Manager. Provide for secure storage of the camera system unless it is immediately installed. After installation, return the original packing and shipping materials in good condition to the Project Manager for storage.

2) Installation. Unless otherwise approved by the Project Manager, install the camera system prior to performing any other work on the project. Install according to the diagram found at the link above.

a) Erect the mounting pole at the location specified by the Project Manager. Embed the pole 6 feet (1.8 m) into the ground. Seat, backfill and compact around the pole. Compact the backfill in 9-inch (225 mm) lifts. Ensure the pole is installed plumb. After erection, install the camera system on the pole according to the drawings and instructions.

3) Service and Maintenance. Provide the Project Manager access to the camera as necessary for adjustments. Clean the camera lens and solar panels as directed by the Project Manager. The camera system components are covered under warranty by the manufacturer. In the event a component or a part of a component requires replacement, hire a qualified technician to remove and replace the part(s). Coordinate all shipping of components or parts necessary for the repair(s).

4) Insurance. Provide insurance for the camera system to cover repair or replacement if it is damaged in any way for any reason. The minimum insured value of the camera system is $10,000.

5) Removal. Upon notification from the Project Manager, remove the camera system and repackage it in the original packing materials. After removal, retain responsibility for the camera system. Provide up to 14 days of secure storage for the camera system until it is transferred back to the Project Manager. The Department will retain ownership of the camera system. Remove the mounting pole, backfill, and re-grade to the original conditions, or as specified elsewhere in the contract. The pole, grounding rod and ground wire will become property of the Contractor upon completion of the project.

D. Method of Measurement. Measurement will be made at 50 percent of Lump Sum bid upon completion of the installation and 50 percent of Lump Sum bid upon the transfer of the

system back to the Project Manager. Camera service or maintenance requirements will be measured under the force account basis as described in Subsection 109.04.2.

E. Basis of Payment. Payment for the completed and accepted quantities is made under the following:

PAY ITEM	PAY UNIT
Install, Remove Camera System	Lump Sum

Costs associated with Service and Maintenance will be paid under Miscellaneous Work.

56. WIDE LOAD ACCOMMODATIONS [618] (REVISED 7-11-19)

Coordinate with the Project Manager to accommodate wide loads during construction. Provide passage of wide loads through the project area a minimum of four consecutive days/ week and two hours/day as approved by the Project Manager. Coordinate with the Project Manager to facilitate passage of wide loads on other projects on the same route or in close proximity. Provide the Project Manager with the name and phone number of the person(s) to be contacted prior to wide loads arriving at the project site.

Place wide load detour signs as directed by the Project Manager. Furnish materials meeting the requirements of Subsection 618.02 and reflective sheeting meeting Subsection 704.01.10. The Project Manager will determine locations of wide load detour signs.

Traffic control devices are paid for at the contract unit price per unit of traffic control devices. The units of each type of traffic control device paid for are calculated by multiplying the measured quantity of each device by the value per each unit shown in the traffic control rate schedule. Wide load detour signs will be paid for as Single Use Signs (SQ FT).

57. TEMPORARY BARRIER RAIL [618] (REVISED 12-7-17)

A. Description. This work includes furnishing, installing, maintaining, and removing temporary barrier rail used for lane separation or protection of construction work zones from traffic.

B. Materials. Furnish concrete barrier rail in accordance with Section 605 and the Detailed Drawings. Alternative barrier design meeting NCHRP 350 TL-3 or MASH TL-3 crash testing may be used. Submit proof of crash testing compliance 14 calendar days prior to installation.

C. Construction Requirements. Furnish, install, maintain, and remove temporary barrier as required by the contract or manufacturer’s instructions. Terminate the ends of temporary concrete barrier with a temporary impact attenuator or with approved blunt end protection as stated in the contract. Blunt end protection not shown on the plans is at Contractor expense.

D. Method of Measurement. Temporary barrier rail will be measured by the foot (m) of barrier placed to protect or channelize traffic as specified in the plans. Transition pieces and terminal ends will be measured for payment. Installation or resetting of barrier rail; required by the Contractor’s operations and not shown on plans or the repair or replacement of temporary barrier rail damaged by the Contractor will not be measured for payment. Removal and replacement of installations damaged by traffic will be measured for payment.

E. Basis of Payment. Payment for the completed and accepted quantities is made under the following:

PAY ITEM	PAY UNIT
Temp Barrier Rail	Foot (m)
Reset Temp Barrier Rail	Foot (m)

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the contract.

58. TRAFFIC CONTROL PLASTIC DRUMS [618] (REVISED 8-15-19)

Beginning on April 1, 2021, ensure all plastic drums include 6-inch retro-reflective white and retro-reflective fluorescent orange sheeting. All other requirements of Detailed Drawing 618-00 still apply.

END SECTION I

Tetra Tech Boring Log Descriptive Terminology

Key to Soil Symbols and Terms

12/06/12

TETRA TECH

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE)	GRAVEL AND GRAVELLY SOILS (MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE)	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	Well-graded gravels, gravel sand mixtures, little or no fines.
				GP	Poorly graded gravels, gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	Silty gravels, gravel-sand-silt mixtures.
				GC	Clayey gravels, gravel-sand-clay mixtures.
	SAND AND SANDY SOILS (MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE)	CLEAN SANDS (LITTLE OR NO FINES)		SW	Well-graded sands, gravelly sands, little or no fines.
				SP	Poorly graded sands, gravelly sands, little or no fines.
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	Silty sands, sand-silt mixtures.
				SC	Clayey sands, sand-clay mixures.
FINE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE)	SILTS AND CLAYS (LIQUID LIMIT LESS THAN 50)			ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
				OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (LIQUID LIMIT GREATER THAN 50)			MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
				CH	Inorganic clays of high plasticity, fat clays.
				OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS				PT	Peat and other highly organic soils.

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

Order of Descriptors

- Group Name
- Consistency or Relative Density
- Moisture Condition
- Color
- Particle size descriptor(s) (coarse grained soils only)
- Angularity of coarse grained soils
- Other relevant notes

Criteria For Descriptors

Consistency of Fine Grained Soils

Consistency	N-Value (uncorrected)
Very Soft	< 2
Soft	2 - 4
Medium Stiff	5 - 8
Stiff	9 - 15
Very Stiff	16 - 30
Hard	> 30

Apparent Density of Coarse Grained Soils

Relative Density	N-Value (uncorrected)
Very Loose	< 4
Loose	4 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

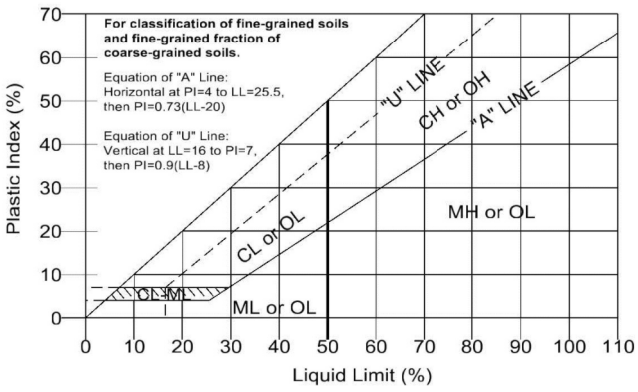
Moisture Condition

Dry	-Absence of moisture, dusty, dry to the touch.
Moist	-Damp, but no visible water.
Wet	-Visible free water.

Definition of Particle Size Ranges

Soil Component	Size Range
Boulder	> 12 in (300 mm)
Cobble	3 in (75 mm) - 12 in (300 mm)
Gravel	No. 4 Sieve (4.75 mm) to 3 in (75 mm)
Sand	No. 200 (0.075 mm) to No. 4 Sieves (4.75 mm)
Silt	< No. 200 Sieve (0.075 mm)*
Clay	< No. 200 Sieve (0.075 mm)*

*Atterberg limits and chart below to differentiate between silt and clay.



Notes

See Soil Boring Information Special Provision.

SPT (Standard Penetration Test-ASTM D1586):
The number of blows of a 140 lb (63.6 kg) hammer falling 2.5 ft (750 mm) used to drive a 2 in (50 mm) O.D. Split Spoon sampler for a total of 1.5 ft (0.45 m) of penetration.
Written as follows:
first 0.5 ft (0.15 m) - second 0.5 ft (0.15 m) - third 0.5 ft (0.15 m) (ex: 1-3-9)
Note: if the number of blows exceeds 50 before 0.5 ft (0.15 m) of penetration is achieved, the actual penetration rounded to the nearest 0.1 ft (0.03 m) follows the number of blows in parentheses (ex: 12-24-50 (0.09 m), 34-50 (0.4 ft), or 100 (0.3 ft)).WR denotes a zero blow count with the weight of the rods only.
WH denotes a zero blow count with the weight of the rods plus the weight of the hammer.

MC=Moisture Content, LL=Liquid limit, PL=Plastic Limit
-200%=percent soil passing 200 sieve, DD=Dry Density

Soil Classifications are Based on the Unified Soil Classification System, ASTM D2487 and D2488. Also included are the AASHTO group classifications (M145). Descriptions are based on visual observation, except where they have been modified to reflect results of laboratory tests as deemed appropriate.

Angularity of Coarse-Grained Particles

Angular	-Particles have sharp edges and relative plane sides with unpolished surfaces.
Subangular	-Particles are similar to angular description, but have rounded edges.
Subrounded	-Particles have nearly plane sides, but have no edges.
Rounded	-Particles have smoothly curved sides and well-rounded corners and edges.

Example soil description: Sandy FAT CLAY (CH), soft, wet, brown. (A-7)

Tetra Tech Boring Log Descriptive Terminology
Key to Rock Symbols and Terms

12/06/12

TETRA TECH

Rock Type	Symbol	Rock Type	Symbol	Rock Type	Symbol
Argillite		Dolomite		Quartzite	
Basalt		Gneiss		Rhyolite	
Bedrock (other)		Granitic		Sandstone	
Breccia		Limestone		Schist	
Claystone		Siltstone		Shale	
		Conglomerate			

Order of Descriptors

- Rock Type
- Color
- Grain size (if applicable)
- Stratification/Foliation (as applicable)
- Field Hardness
- Other relevant notes

Criteria For Descriptors

Grain Size

Description	Characteristic
Coarse Grained	-Individual grains can be easily distinguished by eye
Fine Grained	-Individual grains can be distinguished with difficulty

Stratum Thickness

Thickly Bedded	3-10 ft (1-3 m)
Medium Bedded	1-3 ft (300 mm - 1 m)
Thinly Bedded	2-12 in (50-300 mm)
Very Thinly Bedded	< 2 in (50 mm)

Rock Field Hardness

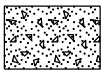
Very Soft	-Can be carved with knife. Can be excavated readily with point of rock hammer. Can be scratched readily by fingernail.
Soft	-Can be grooved or gouged readily by knife or point of rock hammer. Can be excavated in fragments from chips to several inches in size by moderate blows of the point of a rock hammer.
Medium	-Can be grooved or gouged 0.05 in (2 mm) deep by firm pressure of knife or rock hammer point. Can be excavated in small chips to pieces about 1 in (25 mm) maximum size by hard blows of the point of a rock hammer.
Moderately hard	-Can be scratched with knife or pick. Gouges or grooves to 0.25 in (6 mm) can be excavated by hard blow of rock hammer. Hand specimen can be detached by moderate blows.
Hard	-Can be scratched with knife or pick only with difficulty. Hard hammer blows required to detach hand specimen.
Very Hard	-Cannot be scratched with knife or sharp rock hammer point. Breaking of hand specimens requires several hard blows of a rock hammer.

Notes:

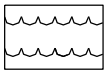
UCS = Unconfined Compressive Strength obtained from laboratory testing at the given depth.

See Soil Boring Information Special Provision.

Miscellaneous Soil/Rock Symbols and Terms

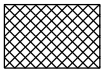

Concrete

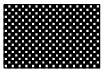

Asphalt

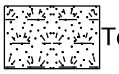

Water


Boulders and Cobbles


Coal


Fill


Millings


Topsoil

Explanation of Text Fields In Boring Logs:

Material Description: Lithologic Description of soil or rock encountered.

Remarks: Comments on drilling, including method, bit type, and problems encountered.

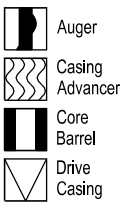
Unless stated on logs as being surveyed by district survey, all locations are considered approximate.

General Notes

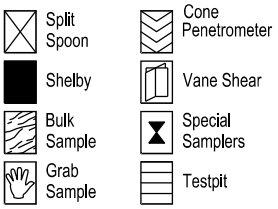
- Descriptions on these boring logs apply only at the specific boring, and at the time the time the borings were made. These logs are not warranted to be representative of subsurface conditions at other locations or times.
- Water level observations apply only at the specific boring, and at the time the borings were made. Due to the variability of groundwater measurements given the type of drilling used, and the stratification of the soil in the boring, these logs are not warranted to be representative of groundwater conditions at other locations or times.
- Other terms may be used as descriptors, as defined by the profession.

-Soil and Rock descriptions are based on visual observation, except where they have been modified to reflect results of laboratory tests as deemed appropriate.

Operation Types:



Sample Types:



Example Rock Log

SANDSTONE, gray, fine grained, thickly bedded, hard field hardness.

TETRA TECH

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES

ASTM Designation: D 2487 – 83

(Based on Unified Soil Classification System)

MAJOR DIVISIONS				GROUP SYMBOL	GROUP NAME
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines	Cu ≥ 4 and 1 ≤ Cc ≤ 3[E]	GW	Well graded gravel [F]
			Cu < 4 and/or 1 > Cc > 3[E]	GP	Poorly graded gravel [F]
		Gravels with Fines More than 12% fines	Fines classify as ML or MH	GM	Silty gravel [F G H]
			Fines classify as CL or CH	GC	Clayey gravel [F G H]
	Sands 50% or more of coarse faction passes No. 4 sieve	Clean Sands Less than 5% fines	Cu ≥ 6 and 1 ≤ Cc ≤ 3[E]	SW	Well-graded sand [I]
			Cu < 6 and/or 1 > Cc > 3[E]	SP	Poorly graded sand [I]
		Sands with Fines More than 12% fines	Fines classify as ML or MH	SM	Silty Sand [G H I]
			Fines classify as CL or CH	SC	Clayey sand [G H I]
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	Inorganic	PI > 7 and plots on or above "A" line	CL	Lean clay [K L M]
			PI < 4 or plots below "A" line	ML	Silt [K L M]
		Organic	Liquid limit – oven dried / Liquid limit – not dried < 0.75	OL	Organic clay [K L M N] Organic silt [K L M O]
	Silts and Clays Liquid limit 50 or more	Inorganic	PI plots on or above "A" line	CH	Fat clay [K L M]
			PI plots below "A" line	MH	Elastic silt [K L M]
		Organic	Liquid limit – oven dried / Liquid limit – not dried < 0.75	OH	Organic clay [K L M O] Organic silt [K L M O]
Highly organic soils	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-in. (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay

[D] Sands with 5 to 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $Cc=(D_{30})^2 / (D_{10} \times D_{90})$

[F] If soil contains ≥15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥15% gravel, add "with gravel" to group name.
If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.

[K]. If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel", whichever is predominant.

[L] If solid contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name.

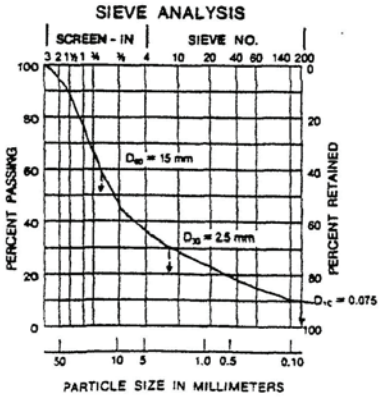
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

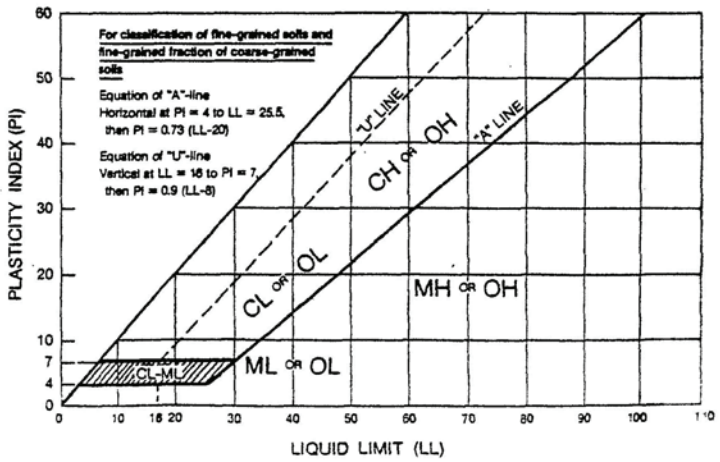
[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A: line.

[P] PI plots on or above "A: line.

[Q] PI plots below "A: line.





$C_u = \frac{D_{50}}{D_{1e}} = \frac{15}{0.075} = 200$ $C_c = \frac{(D_{30})2}{D_{12} \times 10_{36}} + \frac{(2.5)-}{0.075 \times 15} = 5.6$


Figure 1A-1
Tetra Tech Exploratory Boring Locations
Clark Fork - 1M NW Trout Creek
Project No. BH 6-1(142)28; UPN 8022000
Sanders County, Montana
Legend
Boring Location
Vinson Mill Rd
Old Hwy
DH-1
DH-2
Vermillio
DH-3B
DH-3A
200
DH-4
N
900 ft
Google Earth
© 2018 Google

2525 Palmer Street, Suite 2
Missoula, MT 59808
Phone: (406) 543-3045
Fax: (406) 543-3088

AWARD COPY

Figure No. 2A-1

LOG OF BORING

Boring 8022000-DH-1

TETRA TECH

Project: Clark Fork - 1M NW Trout Creek		**Rig:** Mobile B-61 **Hammer:** Auto	**Boring Location** N: 1373074 ft **Coordinates** E: 469993.2 ft	**Station:** **Offset:**
Project Number: 117-8147004	**UPN:** 8022000	**Boring Diameter:** 8 in	**System:** Decimal Degrees **Datum:** NAD83	**Top of Boring Elevation:** 2370.7 ft
Date Started: 1/29/19	**Date Finished:** 1/29/19	**Drilling Fluid:** None	**Location Source:** Surveyed	**Elevation Source:** Surveyed
Driller: O'Keefe **Logger:** Darik Coppedge		**Abandonment Method:** Backfilled with Cuttings	**Township, Range, and Section:** 24N 31W S7	

Depth (ft) Elev. (ft)	Operation	Sample Type	Recovery (%)	RQD (%)	Blow Count	Lithology	Material Description	Depth (ft) Elev. (ft)	MC (%)	LL	PL	-200 (%)	DD	Remarks and Other Tests
			100		50/0.4ft		Asphalt.	0.4	7					pH= 8.72
							BASE COURSE, Poorly-Graded GRAVEL (GP), very dense, slightly moist, brown to black.	*2370.3* 0.8 *2369.9*		19	15	12		Resistivity= 2,250 ohm-cm Sulfate Content= 0.0252 % CBR= 47
5 *2365.7*			73		10 - 15 - 16		Poorly-Graded GRAVEL with silty clay and sand (GP-GC), [A-1]. dense to very dense, moist, brown to tan, subangular, Cuttings remained consistent during drilling period. Split spoon samples seemed to indicate a slight increase in gravel with depth.		5					
10 *2360.7*			53		12 - 18 - 30				5					
15 *2355.7*			67		17 - 21 - 32				5					
							Boring Depth: 15.5 ft, *Elevation: 2355.2 ft*	15.5 *2355.2*						

Water Level Observations		Remarks:
During Drilling: Not Recorded	After Drilling: Not Encountered	
After Drilling: Not Recorded		

MDT_LOG OF BORING - MDT_REVISED_2009+.GDT - 05/29/19 12:01 - N:\GEOTECH\REPORTS\REPORT 2019\MDT PROJECTS\TROUT CREEK\FIELD INVESTIGATION - DRILLING AND SURVEY\TROUT CREEK.GPJ

2525 Palmer Street, Suite 2
Missoula, MT 59808
Phone: (406) 543-3045
Fax: (406) 543-3088

AWARD COPY

Figure No. 2A-2

LOG OF BORING

Boring 8022000-DH-2

TETRA TECH

Project: Clark Fork - 1M NW Trout Creek		**Rig:** Mobile B-61 **Hammer:** Auto	**Boring Location** N: 1372828 ft **Coordinates** E: 470139 ft	**Station:** **Offset:**
Project Number: 117-8147004	**UPN:** 8022000	**Boring Diameter:** 8 in	**System:** Decimal Degrees **Datum:** NAD83	**Top of Boring Elevation:** 2366.3 ft
Date Started: 1/29/19	**Date Finished:** 1/29/19	**Drilling Fluid:** None	**Location Source:** Surveyed	**Elevation Source:** Surveyed
Driller: O'Keefe **Logger:** Darik Coppedge		**Abandonment Method:** Backfilled with Cuttings	**Township, Range, and Section:** 24N 31W S7	

Depth (ft) / Elev. (ft)	Operation	Sample Type	Recovery (%)	RQD (%)	Blow Count	Lithology	Material Description	Depth (ft) / Elev. (ft)	MC (%)	LL	PL	-200 (%)	DD	Remarks and Other Tests
			100		50/0.4ft		Asphalt.	0.3						pH= 8.02 Resistivity= 2,750 ohm-cm Sulfate Content= 0.0131 % CBR= 58
							BASE COURSE, Poorly-Graded GRAVEL (GP), very dense, slightly moist.	2366.0 0.6		18	15	12		
							FILL, Poorly-Graded GRAVEL with silt and sand (GP-GM), [A-1]. dense, moist, brown to gray, subangular.	2365.7	5					
5 2361.3			60		13 - 16 - 15									
							Silty SAND (SM), moist, brown, cuttings recovered from auger mixed with gravel from layer above.	5.5 2360.8						
							Silty GRAVEL (GM), medium dense to dense, moist, brown, Split spoon at 9.0 returned silt gravel and sand lense.	8.0 2358.3	10					
10 2356.3			60		7 - 8 - 12									
15 2351.3			33		9 - 24 - 12				10					
							Poorly-Graded GRAVEL with silt (GP-GM), medium dense to dense, moist, brown to gray, subrounded, Cuttings are mostly gravel. Split spoons at 14-15.5 and 19-20.5 returned silt and gravel.	15.0 2351.3						
20 2346.3			80		10 - 9 - 9				10					
							Poorly-Graded GRAVEL with clay (GP-GC), [A-2]. medium dense to dense, moist to wet, brown to gray, Cuttings look like a mix of clay and gravel. Split spoon at 24 feet has increased sand content.	24.0 2342.3	6					
25 2341.3			67		14 - 23 - 20					27	18	11		
30			73		12 - 14 - 15				7					
2336.3														

Water Level Observations		Remarks:
▼ After Drilling: 35.0 ft *(2331.3 ft)*	▽ During Drilling: Not Recorded	
	▼ After Drilling: Not Recorded	

MDT_LOG OF BORING - MDT_REVISED_2009+.GDT - 05/29/19 12:02 - N:\GEOTECH\REPORTS\REPORT 2019\MDT PROJECTS\TROUT CREEK\FIELD INVESTIGATION - DRILLING AND SURVEY\TROUT CREEK.GPJ

2525 Palmer Street, Suite 2
Missoula, MT 59808
Phone: (406) 543-3045
Fax: (406) 543-3088

AWARD COPY

Figure No. 2A-2

LOG OF BORING

Boring 8022000-DH-2

TETRA TECH

Project: Clark Fork - 1M NW Trout Creek		**Rig:** Mobile B-61 **Hammer:** Auto	**Boring Location** N: 1372828 ft **Coordinates** E: 470139 ft	**Station:** **Offset:**
Project Number: 117-8147004	**UPN:** 8022000	**Boring Diameter:** 8 in	**System:** Decimal Degrees **Datum:** NAD83	**Top of Boring Elevation:** 2366.3 ft
Date Started: 1/29/19	**Date Finished:** 1/29/19	**Drilling Fluid:** None	**Location Source:** Surveyed	**Elevation Source:** Surveyed
Driller: O'Keefe **Logger:** Darik Coppedge		**Abandonment Method:** Backfilled with Cuttings	**Township, Range, and Section:** 24N 31W S7	

Depth (ft) Elev. (ft)	Operation	Sample Type	Recovery (%)	RQD (%)	Blow Count	Lithology	Material Description	Depth (ft) Elev. (ft)	MC (%)	LL	PL	-200 (%)	DD	Remarks and Other Tests
35 *2331.3*			27		8 - 8 - 24		Boring Depth: 35.5 ft, *Elevation: 2330.8 ft*	35.5 *2330.8*	8					

Water Level Observations		Remarks:
After Drilling: 35.0 ft *(2331.3 ft)*	During Drilling: Not Recorded	
	After Drilling: Not Recorded	

2525 Palmer Street, Suite 2
Missoula, MT 59808
Phone: (406) 543-3045
Fax: (406) 543-3088

AWARD COPY

Figure No. 2A-3

LOG OF BORING

Boring 8022000-DH-3A

TETRA TECH

Project: Clark Fork - 1M NW Trout Creek		**Rig:** Mobile B-61 **Hammer:** Auto	**Boring Location** N: 1371774 ft **Coordinates** E: 470640.2 ft	**Station:** **Offset:**
Project Number: 117-8147004	**UPN:** 8022000	**Boring Diameter:** 8 in	**System:** Decimal Degrees **Datum:** NAD83	**Top of Boring Elevation:** 2354.8 ft
Date Started: 1/28/19	**Date Finished:** 1/28/19	**Drilling Fluid:** None	**Location Source:** Surveyed	**Elevation Source:** Surveyed
Driller: O'Keefe **Logger:** Darik Coppedge		**Abandonment Method:** Backfilled with Cuttings	**Township, Range, and Section:** 24N 31W S8	

Depth (ft) / Elev. (ft)	Operation	Sample Type	Recovery (%)	RQD (%)	Blow Count	Lithology	Material Description	Depth (ft) / Elev. (ft)	MC (%)	LL	PL	-200 (%)	DD	Remarks and Other Tests
			100		50		Asphalt.	0.3 / 2354.5		23	18	14		pH= 7.45 Resistivity= 2,300 ohm-cm Sulfate Content= 0.0073 % CBR= 36
							BASE COURSE, (GP), slightly moist, black to gray.	0.8 / 2354.0	7					
			50		15 - 14 - 50/0.4ft		FILL, Silty, Clayey GRAVEL with sand (GC-GM), [A-1]. very dense, moist, brown, subangular.							
5 / 2349.8			80		10 - 10 - 14		Poorly-Graded GRAVEL with silt and sand (GP-GM), medium dense, slightly moist.	4.0 / 2350.8	10					
			67		8 - 7 - 13				7					
10 / 2344.8			53		14 - 13 - 10				5					
							Poorly-Graded GRAVEL (GP), No cuttings recovered from layer, auger refusal at 13.0 feet..	11.5 / 2343.3						
							Boring Depth: 13.0 ft, *Elevation: 2341.8 ft*	13.0 / 2341.8						

Water Level Observations		Remarks:
After Drilling: Not Encountered	During Drilling: Not Recorded After Drilling: Not Recorded	

MDT_LOG OF BORING - MDT_REVISED_2009+.GDT - 05/29/19 12:02 - N:\GEOTECH\REPORTS\REPORT 2019\MDT PROJECTS\TROUT CREEK\FIELD INVESTIGATION - DRILLING AND SURVEY\TROUT CREEK.GPJ

2525 Palmer Street, Suite 2
Missoula, MT 59808
Phone: (406) 543-3045
Fax: (406) 543-3088

AWARD COPY

Figure No. 2A-4

LOG OF BORING

Boring 8022000-DH-3B

TETRA TECH

Project: Clark Fork - 1M NW Trout Creek		**Rig:** Mobile B-61 **Hammer:** Auto	**Boring Location** N: 1371761 ft **Coordinates** E: 470645.6 ft	**Station:** **Offset:**
Project Number: 117-8147004	**UPN:** 8022000	**Boring Diameter:** 8 in	**System:** Decimal Degrees **Datum:** NAD83	**Top of Boring Elevation:** 2354.7 ft
Date Started: 1/28/19	**Date Finished:** 1/28/19	**Drilling Fluid:** None	**Location Source:** Surveyed	**Elevation Source:** Surveyed
Driller: O'Keefe **Logger:** Darik Coppedge		**Abandonment Method:** Backfilled with Cuttings	**Township, Range, and Section:** 24N 31W S8	

Depth (ft) / Elev. (ft)	Operation	Sample Type	Recovery (%)	RQD (%)	Blow Count	Lithology	Material Description	Depth (ft) / Elev. (ft)	MC (%)	LL	PL	-200 (%)	DD	Remarks and Other Tests
							Asphalt.	0.4						
			80		38 - 42 - 39		BASE COURSE, Poorly-Graded GRAVEL (GP), very dense, slightly moist.	*2354.3* 0.8 *2353.9*						
							FILL, Poorly-Graded GRAVEL with silt and sand (GP-GM), medium dense to very dense, slightly moist, brown to tan/brown.		8					
5 *2349.7*			60		8 - 8 - 12									
								9.0 *2345.7*	5					
10 *2344.7*			27		23 - 22 - 15		Poorly-Graded GRAVEL with silty clay and sand (GP-GC), [A-1]. medium dense to dense, moist, brown to tan.			22	17	12		
									2					
15 *2339.7*			27		33 - 16 - 8									
									2					
20 *2334.7*			33		7 - 8 - 12									
							Poorly-Graded GRAVEL (GP), medium dense, wet, gray to brown, subangular, angular gravel in split spoon. ▽	21.0 *2333.7*						
25 *2329.7*			13		8 - 12 - 9									
							Silty GRAVEL with sand (GM), medium dense, wet,	29.0 *2325.7*						
30 *2324.7*			47		5 - 5 - 10									

Water Level Observations

▽ During Drilling: 23.0 ft *(2331.7 ft)*

▼ After Drilling: Not Recorded

▽ After Drilling: Not Recorded

Remarks: Second attempt of DH-3

MDT_LOG OF BORING - MDT_REVISED_2009+.GDT - 05/29/19 12:02 - N:\GEOTECH\REPORTS\REPORT 2019\MDT PROJECTS\TROUT CREEK\FIELD INVESTIGATION - DRILLING AND SURVEY\TROUT CREEK.GPJ

2525 Palmer Street, Suite 2
Missoula, MT 59808
Phone: (406) 543-3045
Fax: (406) 543-3088

AWARD COPY

Figure No. 2A-4

LOG OF BORING

Boring 8022000-DH-3B

TETRA TECH

Project: Clark Fork - 1M NW Trout Creek		**Rig:** Mobile B-61 **Hammer:** Auto	**Boring Location** N: 1371761 ft **Coordinates** E: 470645.6 ft	**Station:** **Offset:**
Project Number: 117-8147004	**UPN:** 8022000	**Boring Diameter:** 8 in	**System:** Decimal Degrees **Datum:** NAD83	**Top of Boring Elevation:** 2354.7 ft
Date Started: 1/28/19	**Date Finished:** 1/28/19	**Drilling Fluid:** None	**Location Source:** Surveyed	**Elevation Source:** Surveyed
Driller: O'Keefe **Logger:** Darik Coppedge		**Abandonment Method:** Backfilled with Cuttings	**Township, Range, and Section:** 24N 31W S8	

Depth (ft) Elev. (ft)	Operation	Sample Type	Recovery (%)	RQD (%)	Blow Count	Lithology	Material Description	Depth (ft) Elev. (ft)	MC (%)	LL	PL	-200 (%)	DD	Remarks and Other Tests
35 2319.7			87		13 - 12 - 13		Split spoons indcate fine gravel interbedded with sand and silt, no cuttings recovered from auger.	35.5 2319.2						

Boring Depth: 35.5 ft, *Elevation: 2319.2 ft*

Water Level Observations		
After Drilling: Not Recorded	During Drilling: 23.0 ft *(2331.7 ft)*	Remarks: Second attempt of DH-3
	After Drilling: Not Recorded	

MDT_LOG OF BORING - MDT_REVISED_2009+.GDT - 05/29/19 12:02 - N:\GEOTECH\REPORTS\REPORT 2019\MDT PROJECTS\TROUT CREEK\FIELD INVESTIGATION - DRILLING AND SURVEY\TROUT CREEK.GPJ

2525 Palmer Street, Suite 2
Missoula, MT 59808
Phone: (406) 543-3045
Fax: (406) 543-3088

AWARD COPY

Figure No. 2A-5

LOG OF BORING

Boring 8022000-DH-4

TETRA TECH

Project: Clark Fork - 1M NW Trout Creek		**Rig:** Mobile B-61 **Hammer:** Auto	**Boring Location** N: 1371109 ft **Coordinates** E: 470966.3 ft	**Station:** **Offset:**
Project Number: 117-8147004	**UPN:** 8022000	**Boring Diameter:** 8 in	**System:** Decimal Degrees **Datum:** NAD83	**Top of Boring Elevation:** 2348.3 ft
Date Started: 1/29/19	**Date Finished:** 1/29/19	**Drilling Fluid:** None	**Location Source:** Surveyed	**Elevation Source:** Surveyed
Driller: O'Keefe **Logger:** Darik Coppedge		**Abandonment Method:** Backfilled with Cuttings	**Township, Range, and Section:** 24N 31W S8	

Depth (ft) / Elev. (ft)	Operation	Sample Type	Recovery (%)	RQD (%)	Blow Count	Lithology	Material Description	Depth (ft) / Elev. (ft)	MC (%)	LL	PL	-200 (%)	DD	Remarks and Other Tests
			100		50/0.4ft		Asphalt.	0.3						pH= 9.10 Resistivity= 4,400 ohm-cm Sulfate Content= 0.0056 % CBR= 21
							BASE COURSE, Poorly-Graded GRAVEL (GP), very dense, slightly moist.	*2348.0* 0.7 *2347.6*		18	15	13		
							FILL, Silty GRAVEL with sand (GM), [A-1]. very dense, slightly moist, brown to tan/brown, fine to medium grained, subrounded.		6					
5 *2343.3*			93		18 - 38 - 47									
								9.0 *2339.3*	7					
10 *2338.3*			44		28 - 50/0.4ft		Poorly-Graded SAND with silt and gravel (SP-SM), moist, Split spoon contained some silt and sand.							
							Silty SAND with gravel (SM), [A-2]. moist, brown, subrounded.	11.0 *2337.3*		15	13	27		
							ORGANIC SOIL (OL), very moist, black to brown, no recovery from auger, silty material, organics, wood, roots.	14.0 *2334.3*	21					
15 *2333.3*			80		7 - 7 - 11			15.5 *2332.8*						

Boring Depth: 15.5 ft, *Elevation: 2332.8 ft*

Water Level Observations		Remarks:
After Drilling: Not Recorded	During Drilling: 23.0 ft *(2325.3 ft)*	
	After Drilling: Not Recorded	

MDT_LOG OF BORING - MDT_REVISED_2009+.GDT - 05/29/19 12:02 - N:\GEOTECH\REPORTS\REPORT 2019\MDT PROJECTS\TROUT CREEK\FIELD INVESTIGATION - DRILLING AND SURVEY\TROUT CREEK.GPJ

STANDARD PROVISIONS INDEX

TRAFFIC CONTROL RATE SCHEDULE

(Subsections 618.04.1 & 618.05.1 of the Specifications)
(Traffic Control – Fixed will be at $1 per unit)

Group No.		Traffic Control Device Description	Value in Units of Each Traffic Control Device
1.	Any Size Sign	Signs on Portable Mounts	34/each
2.	Sign Faces up to 15.9 square feet (1.48 square meter)	Signs Mounted on Single Post	130/each
3.	16.0 up to 19.9 square feet (1.49 up to 1.85 square meter)	Signs Mounted on Single Post	136/each
4.	20.0 up to 29.9 square feet (1.86 up to 2.78 square meter)	Signs Mounted on Single Post	148/each
5.	30.0 up to 40.0 square feet (2.79 up to 3.72 square meter)	Signs Mounted on Single Post	216/each
6.	10.0 up to 18.1 square feet (0.93 up to 1.68 square meter)	Signs Mounted on Two Posts	238/each
7.	18.2 up to 19.9 square feet (1.69 up to 1.85 square meter)	Signs Mounted on Two Posts	248/each
8.	20.0 up to 29.9 square feet (1.86 up to 2.78 square meter)	Signs Mounted on Two Posts	268/each
9.	30.0 up to 39.9 square feet (2.79 up to 3.71 square meter)	Signs Mounted on Two Posts	332/each
10.	40.0 up to 49.9 square feet (3.72 up to 4.64 square meter)	Signs Mounted on Two Posts	350/each
11.	50.0 up to 59.9 square feet (4.65 up to 5.57 square meter)	Signs Mounted on Two Posts	512/each
12.	Sign Faces up to 20.0 square feet (1.82 square meter) mounted on Type III Barricade (sign only)	Signs Mounted on Barricade	26/each
13.	4'-0" (1.2 m) to 10'-0" (3.0 m) B (III)	Barricade (reflectorized on one side)	180/each
14.	4'-0" (1.2 m) to 10'-0" (3.0 m) B (III)	Barricade (reflectorized both sides)	188/each
15.	Portable Barricade		
	(1) 2’-0” (0.6 m) to 6’-0” (1.8 m) B (I)	Portable Barricade	22/each
	(2) 2’-0” (0.6 m) to 6’-0” (1.8 m) B (II)	Portable Barricade	22/each
	(3) Type II w/ 24”x12” R9-9,R9-10, or R9-11a Pedestrian Sign	Portable Barricade	24/each

TRAFFIC CONTROL RATE SCHEDULE

(Subsections 618.04.1 & 618.05.1 of the Specifications)
(Traffic Control – Fixed will be at $1 per unit)

Group No.	Traffic Control Device Description	Value in Units of Each Traffic Control Device
16.	Barricade Warning Lights	
	(1) Type A - Low Intensity	10/each/day
	(2) Type B - High Intensity	14/each/day
	(3) Type C - Steady Burn	10/each/day
17.	Drums Plastic	14/each
18.	Object Markers	
	(1) Type 2 Object Markers	26/each
19.	Portable Vertical Panel	14/each
20.	Delineators	
	(1) Design B Delineators	24/each
	(2) Design G Delineators	24/each
	(3) Design A Delineators	24/each
21.	Deleted	
22.	Flexible guide posts	8/each
23.	Portable Arrow Board	
	(1) Set up/take down each shift	12/each/hour
	(2) Long term use	202/each/day
	(2a) Initial Install (only for long term use)	40/each/install
24.	W20-7a and W3-3 Signs with LED Flashers	
	(1) Set up/take down each shift	18/each/hour
	(2) Long term use	172/each/day
	(2a) Initial Install (only for long term use)	18/each/install
25.	Raised rigid pavement markers	6/each
26.	Deleted	
27.	Hinged flexible guide posts 36" (914mm) height	56/each
28.	Deleted	
29.	Temporary traffic control signals (with dual lights and adjustable mast arms)	
	(1) Set up/take down each shift	36/each/hour
	(2) Long term use with initial install	646/each/day
	(2a) Initial Install (only for long term use)	52/each/install
30.	Temporary traffic tape yellow or white 4" (102mm)	4/foot 13/m

TRAFFIC CONTROL RATE SCHEDULE

(Subsections 618.04.1 & 618.05.1 of the Specifications)
(Traffic Control – Fixed will be at $1 per unit)

Group No.	Traffic Control Device Description		Value in Units of Each Traffic Control Device
31.	Changeable Message Signs, 3 line 8'x8' (2.7m x 2.7m) size		
	(1) Set up/take down each shift		18/each/hour
	(2) Long term use with initial install		300/each/day
	(2a) Initial Install (only for long term use)		44/each/install
32.	Install or remove signs on existing post mount		6/each
33.	Deleted		
34.	Flag Person	Zone 1	56/each/hour
		Zone 2	60/each/hour
		Zone 3	62/each/hour
35.	Pilot Car	Zone 1	86/each/hour
		Zone 2	90/each/hour
		Zone 3	90/each/hour
36.	Flagger Illumination		
	(1) Portable Light Tower		14/each/hour
	(2) Non-Glare (Balloon) Lighting		18/each/hour
37.	Alternative Devices: Items not covered under this rate schedule may be included as alternate devices. The rate will be determined in accordance with Subsection 109.04.1 or 109.04.2		Agreed upon prices converted to number of units
38.	Deleted		
39.	Pedestrian temporary curb ramp		284/each
40.	Pedestrian barricade		24/ft 78/m
41.	Deleted		
42.	Temporary Portable Transverse Rumble Strips 11ft (3.4 m) length		246/each
43.	Illuminated Flagger Paddle		6/each/hour
44.	Business Access Signs (including business name)		44/sq ft (478/ sq m)

2015 Erosion & Sediment Control Rate Schedule
Rev. 10/8/15

Group No.	Erosion/Sediment Control Device	Value in Units per Each English (metric)
SS-2 Mulch Cover		
	Mulch, Hydraulic Wood – 1000 ft^2 (100 m^2)	60 (65)
	Mulch, Dry Straw, Hand Sown – 1000 ft^2 (100 m^2)	120 (129)
	Mulch, Composting – 1000 ft^2 (100 m^2)	150 (162)
SS-4 Erosion Seeding		
	Erosion Seeding by Hand – Acre (ha)	200 (494)
SS-5 Soil Binder		
	Guar – Acre (ha)	380 (938)
SS-6 Rolled Erosion Control Blankets		
	Non-biodegradable	
	Class I & 2 Geotextiles – 1000 ft^2 (100 m^2)	380 (409)
	Class 3 Geotextiles – 1000 ft^2 (100 m^2)	480 (517)
	Plastic Cover – 1000 ft^2 (100 m^2)	300 (323)
	Biodegradable	
	Straw/Coconut (70/30) Erosion Control Blankets – 1000 ft^2 (100 m^2)	225 (242)
	Coconut (Coir) Erosion Control Blankets – 1000 ft^2 (100 m^2)	390 (420)
SC-1 Silt Fence		
	Unstabilized Silt Fence – 100 ft (30 m)	230 (226)
	Stabilized Silt Fence – 100 ft (30 m)	540 (532)
SC-4 Check Dams		
	Rock Check Dam – 1 yd^3 (1 m^3)	100 (132)
	Triangular 10” Silt Dike – 25 ft (1 m)	240 (32)
SC-5 Dugout Ditch Basin – each		20
SC-6 Fiber Rolls (Not used for inlet/outlet protection)		
	8” Fiber Rolls – 100 ft (30 m)	290 (285)
	12” Fiber Rolls – 100 ft (30 m)	350 (345)
SC-7 Compost Socks		
	8” Compost Socks – 100 ft (30 m)	260 (256)
	12” Compost Socks – 100 ft (30 m)	320 (315)
SC-8 Brush Barrier – 100 ft (30 m)		270 (266)
SC-9 Sandbag Barrier (Not used for inlet/outlet protection) – 100 ft (30 m)		180 (177)
SC-10 Gravel Bag Berm – 100 ft (30 m)		310 (305)

SC-12 Inlet/Outlet Protection	
Silt Fence Barrier – each	70
Straw Bale Barrier – each	110
Sandbag Barrier – each	110
Gravel and Mesh Barrier – each	160
8” Fiber Roll – 100 ft (30 m)	340 (335)
Wire Wrapped Rock Wattles – each	100
Curb Socks – each	100
Below Inlet Grate Device – each	140

General Decision Number: MT190079 01/04/2019 MT79

Superseded General Decision Number: MT20180080

State: Montana

Construction Type: Highway

Counties: Montana Statewide.

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.60 for calendar year 2019 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 $10.60 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 2019. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at ww.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/04/2019

* SUMT2014-001 02/19/2014

	Rates	Fringes
CARPENTER		
Carpenter/Piledriverman....	$ 29.00	11.82
Millwright.....	$ 32.00	11.82

Zone 1: 0 to 25 miles - Free
Zone 2: 25 to 50 miles - Base Pay +$2.50
Zone 3: Over 50 miles - Base Pay +$3.00

The Carpenter zone hourly rate applicable to each project shall be determined by measuring the road miles over the shortest practical maintained route from the County Courthouse of the following cities to the center of the job: Billings, Bozeman, Butte, Great Falls, Helena, Missoula, Kalispell

The agency shall calculate the mileage and include it in the special provisions of the bid documents and awarded contract.

CEMENT MASON/CONCRETE FINISHER...$ 24.87 10.80

Zone 1: 0 to 25 miles - Free
Zone 2: 25 to 50 miles - Base + $2.50
Zone 3: Over 50 miles -Base + $3.00

The Cement Mason/Concrete Finisher zone hourly rate applicable to each project shall be determined by measuring the road miles over the shortest practical maintained route from the County Courthouse of the following cities to the center of the job: Billings, Bozeman, Butte, Great Falls, Helena, Missoula, Kalispell

The agency shall calculate the mileage and include it in the special provisions of the bid documents and awarded contract

DIVER

Diver Tender.....$ 37.16 14.52
Diving.....$ 76.32 14.52
Stand-By.....$ 38.16 14.52

The tender shall receive 2 hours at the straight time pay rate per shift for dressing and/or undressing a Diver when work is done under hyperbaric conditions.

Depth Pay (Surface Diving):

0-20 ft.: Free zone
>20-100 ft.: $2.00 per ft.
>100-150 ft.: $3.00 per ft.
>150-220 ft.: $4 00 per ft.
>220 ft.: $5.00 per ft.

Diving in Enclosures (Diver Only):
0-25 ft.: Free zone
>25-300 ft.: $1.00 per ft.

DIVER ZONE PAY:

The hourly wage rates applicable to each project shall be determined by measuring the road miles over the shortest practical maintained route from the County Court House of the following cities only to the center of the job: Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, Missoula

Zone 1: 0 to 25 miles - Free
Zone 2: 25 to 50 miles - Base Pay +$2.50
Zone 3: Over 50 miles - Base Pay +$3.00

The agency shall calculate the mileage and include it in the special provisions of the bid documents and awarded contract

ELECTRICIAN (LINE CONSTRUCTION)

Equipment Operator.....$ 33.27 14.16
Groundman.....$ 25.98 13.25
Lineman.....$ 43.43 15.38

TRAVEL PAY:

$50.00 per day - 0-25 Miles from the County Courthouse of the following cities: Billings, Bozeman, Butte, Great Falls, Helena, Kalispell and Missoula

$60.00 per day - Over 25 Miles

The agency shall calculate the mileage and include it in the special provisions of the bid documents and awarded contract

ELECTRICIAN

All Areas.....$ 32.74 13.42

TRAVEL PAY:

Zone 1: 0 to 10 miles – Free
Zone 2: 10 to 60 miles - Federal mileage both ways/day
Zone 3: Over 60 miles - $75.00 per day

The Electrician zone hourly rate applicable to each project shall be determined by measuring the road miles over the shortest practical maintained route from the County Courthouse of the following cities to the center of the job: Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, Missoula

The agency shall calculate the mileage and include it in the special provisions of the bid documents and awarded contract

IRONWORKER.....$ 27.25 20.98

TRAVEL PAY:

0 to 45 miles - Free
45-85 miles - $55.00 per day
Over 85 miles - $85.00 per day

The Ironworker zone hourly rate applicable to each project shall be determined by measuring the road miles over the shortest practical maintained route from the County Courthouse of the following cities to the center of the job: Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, Missoula

Zone 1: 0 to 25 miles - Free
Zone 2: 25 to 50 miles - Base + $2.50
Zone 3: Over 50 miles - Base + $3.00

The agency shall calculate the mileage and include it in the special provisions of the bid documents and awarded contract

LABORER

Group 1.....$ 20.90 9.60
Group 2.....$ 23.97 9.60
Group 3.....$ 24.19 9.60
Group 4.....$ 25.18 9.60

GROUP 1: Flag Person
GROUP 2: All General Labor work; Burning Bar; Bucket Man; Carpenter Tender; Caisson Worker; Cement Mason Tender; Cement Handler (dry); Chuck Tender; Choker Setter; Concrete Worker; Curb Machine-Lay Down; Crusher and Batch Plant Worker; Fence Erector; Form Setter; Form Stripper; Heater Tender; Landscaper; Pipe Wrapper; Pot Tender; Powderman Tender; Rail and Truck Loaders and Unloaders; Rip rapper; Sealants for Concrete and other materials; Sign Erection, Guard Rail and Jersey Rail; Stake Jumper; Spike Driver; Signalman; Tail Hose man; Tool Checker and Houseman; Traffic Control Worker

GROUP 3: Concrete Vibrator; Dumpman (Grademan); Equipment Handler; Geotextile and Liners; High-Pressure Nozzleman; Jackhammer (Pavement Breaker); Laser Equipment; Non-riding Rollers; Pipelayer; Posthole Digger (power); Power Driven Wheelbarrow; Rigger; Sandblaster; Sod- Cutter-power; Tampers

GROUP 4: Asphalt Raker; Cutting Torch; Grade Setter; High-Scaler; Power Saws (Faller & Concrete); Powderman ($1.00 per hour above Group 4 rate); Rock & Core Drill; Track or Truck Mounted Wagon Drill; Welder including Air Arc

LABORERS ZONE PAY:

The hourly wage rates applicable to each project shall be determined by measuring the road miles over the shortest practical maintained route from the County Court House of the following cities only to the center of the job: Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, Missoula

Zone 1: 0 to 25 miles - Free
Zone 2: 25 to 50 miles - Base Pay +$2.50
Zone 3: Over 50 miles - Base Pay +$3.00

The agency shall calculate the mileage and include it in the special provisions of the bid documents and awarded contract

PAINTER (Pavement Marking/Milling and related work. Includes operating marking and all other equipment and all work involved in application of pavement markings including epoxies, paints, tape, buttons, thermo-plastics and any other products applied for traffic marking purposes and for directing and regulating traffic and cutting rumble strips) .....$ 28.00 10.30

PAINTER ZONE PAY:

The hourly wage rates applicable to each project shall be determined by measuring the road miles over the shortest practical maintained route from the County Court House of the following cities only to the center of the job: Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, Missoula

ZONE 1: 0 to 25 miles - Free
ZONE 2: 25 to 50 miles - Base Pay +$2.50
ZONE 3: Over 50 miles - Base Pay +$3.00

The agency shall calculate the mileage and include it in the special provisions of the bid documents and awarded contract.

POWER EQUIPMENT OPERATOR:

Group 1.....	$ 26.52	10.40
Group 2.....	$ 28.55	10.40
Group 3.....	$ 29.41	10.40
Group 4.....	$ 30.10	10.40
Group 5.....	$ 31.44	10.40
Group 6.....	$ 32.13	10.40
Group 7.....	$ 34.23	10.40

GROUP 1: Air Compressor; Auto Fine Graders; Belt Finishing Machine; Boring Machine (small); Cement Silo; Crane, A-Frame Truck Crane; Crusher Conveyor; DW-10, 15, and 20 Tractor Roller; Farm Tractor; Forklift; Form Grader; Front End Loader Under 1 CU Yard; Heavy Duty Drills; Herman Nelson Heater; Mulching Machine; Oiler, All Except Cranes & Shovels; Pump man

GROUP 2: Air Doctor; Backhoe/Excavator/Shovel to and including 3 CU Yard; Bit Grinder; Bituminous Paving Travel Plant; Boring Machine Large; Broom, Self-Propelled; Concrete Travel Batcher; Concrete Float & Spreader; Concrete Bucket Dispatcher; Concrete Finish Machine; Concrete Conveyor; Distributor; Dozer; Rubber-Tired, Push & Side Boom; Elevating Grader/Gradall; Field Equipment Serviceman; Front End Loader 1 CU Yard to including 5 CU Yard; Grade Setter; Heavy Duty Drills, All Types; Hoist/Tugger, All; Hydralift & Similar; Industrial Locomotive; Motor Patrol, Except Finish; Mountain Skidder; Oiler - Cranes & Shovels; Pavement Breaker, EMSCO; Power Saw, Self-Propelled; Pugmill; Pumpcrete/Grout Machine; Punch Truck; Roller, Other Than Asphalt; Roller, Sheepsfoot, Self-Propelled; Roller, 25 Tons and Over; Ross Carrier; Rotomill Under 6 Ft; Trenching Machine; Washing/Screening Plant

GROUP 3: Asphalt Paving Machine; Asphalt Screed; Backhoe/Excavator/Shovel Over 3 CU Yard; Cableway Highline; Concrete Batch Plant; Concrete Curing Machine; Concrete Pump; Cranes; Creter; Cranes, Electric Overhead; Cranes 24 Tons and Under; Curb Machine/Slip Form Paver; Finish Dozer; Front End Loader Over 5 CU Yard; Mechanic/Welder; Pioneer Dozer; Roller Asphalt (Breakdown & Finish); Rotomill, Over 6 FT; Scraper, Single, Twin or Pulling Belly Dump; Yo-Yo Cat

GROUP 4: Asphalt/Hot Plant Operator, Cranes, 25 Tons to 44 Tons; Crusher Operator; Finish Motor Patrol; Finish Scraper

GROUP 5: Cranes, 45 Tons to Including 74 Tons

GROUP 6: Cranes, 75 Tons to Including 149 Tons; Crane, Whirley (All)

GROUP 7: Cranes, 150 Tons to Including 250 Tons (Add $ 1.00 for Every 100 Tons Over 250 Tons; Crane, Tower (All)

POWER EQUIPMENT OPERATOR ZONE PAY:

The hourly wage rates applicable to each project shall be determined by measuring the road miles over the shortest practical maintained route from the County Court House of the following cities only to the center of the job: Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, Missoula

Zone 1: 0 to 25 miles - Free
Zone 2: 25 to 50 miles - Base Pay +$2.50
Zone 3: Over 50 miles - Base Pay +$3.00

The agency shall calculate the mileage and include it in the special provisions of the bid documents and awarded contract

TRUCK DRIVER

Group 1.....$ 22.39 10.16
Group 2.....$ 28.06 10.16

GROUP 1: Pilot Car

GROUP 2: Combination Truck and Concrete Mixer and Transit Mixer; Dry Batch Trucks; Distributor Driver; Dumpman; Dump Trucks and Similar Equipment; Dumpster; Flat Trucks; Lumber Carriers; Lowboys; Pickup; Powder Truck Driver; Power Boom; Serviceman; Service Truck/Fuel Truck/ Tireperson; Truck Mechanic; Trucks with Power Equipment; Warehouseman, Partsman, Cardex and Warehouse Expeditor; Water Trucks

TRUCK DRIVER ZONE PAY:

The hourly wage rates applicable to each project shall be determined by measuring the road miles over the shortest practical maintained route from the County Court House of the following cities only to the center of the job: Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, Missoula

Zone 1: 0 To 25 Miles - Free
Zone 2: 25 To 50 Miles - Base Pay +$2.50
Zone 3: Over 50 Miles - Base Pay +$3.00

The agency shall calculate the mileage and include it in the special provisions of the bid documents and awarded contract

---

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

==========

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive

care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier. A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can

be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed. With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations.

Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7).

Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board).

Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.

Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

==========

END OF GENERAL DECISION

Effective 12/12/19

"CONTRACTOR REQUIREMENTS AND ACKNOWLEDGMENT FOR WORKING ON RAILROAD RIGHT-OF-WAY"

This document must be dated and signed by the Contractor and submitted to the State before occupying or working on Railroad right-of-way.

1) No change, which has a direct effect on the Railroad, will be made to construction plans without submitting revised plans and receiving approval from the Railroad. Work covered by the plans, that requires flagging, will be covered by the Railroad/Highway Agreement. For work that is a result of the contractor's discretion, flagging protection will be required when equipment crosses or is working within 25 feet (7.62 meters) of center of any live track. When deemed necessary by local Railroad officers, a flagman may be required at all times while working on Railroad right-of-way in high density rail traffic area.

2) Crossing of any Railroad tracks must be done at approved locations and must be full depth timber, rubber, etc. Any equipment with steel wheels, lugs or tracks must not cross steel rails without the use of rubber tires or other approved protection. This shall apply specifically to, but not be limited to, access for Contractor furnished gravel, borrow or waste sites. The Contractor will be required to obtain a permit from the Railroad, and comply with any provisions thereof, before using any private Railroad crossings. All track crossing locations must be covered by a Private Roadway and Crossing Agreement. This does not apply to any public crossing.

3) Costs of flagging or planking protection of the tracks, which are a direct result of the planned construction, will be paid for by the State. Costs of flagging, planking for protection of the tracks, installation of new crossings or other work caused by the Contractor's discretion, will be paid by the Contractor.

4) When work to be performed by the Contractor is not covered in the Railroad/Highway agreement, the Contractor must furnish a plan to the Railroad for approval showing details as to how any work that may affect the Railroad will be accomplished.

5) Storing of construction materials or any other material, including dirt, sand, etc., within the Railroad right-of-way, will not be allowed unless covered by an easement, construction permit, or Contractor's permit/lease.

6) Construction within 25 feet (7.62 meters) of the center of any track not covered by the Railroad/Highway agreement will require plan approval and authorization by the Railroad Superintendent Maintenance and Engineering. This includes, but is not limited to, any excavation, slope work and driving of sheet piling.

7) No vehicles, equipment or machines shall be parked or stored unattended within 25 feet (7.62 meters) of any track, on railroad right-of-way, without specific written approval of the Railroad.

8) When any work is to be performed on Railroad property by the Contractor that is not shown in the construction plans, the Contractor must submit a detailed plan of the work to the Railroad for their approval.

CONTRACTOR'S ACKNOWLEDGMENT:

_____
Company

By: _____
Name

_____
Title

_____
Date

WORK SITE LOCATION:

_____
Town

_____
State

_____
Project #

Rev. 01/01/04

SPECIAL PROVISION
TABLE OF CONTRACTOR SUBMITTALS
(Revised 11-15-18)

This Table of Contractor Submittals summarizes the minimum required submittals. The table references and notes any revisions to the Standard and Supplemental Specifications and clarifies the submittal process. The table may not be all-inclusive and does not include submittals required by other Special Provisions. Provide all submittals required by the contract, including those not listed in the table. If a discrepancy exists, submittals required by other Special Provisions in the Contract supersede this Table of Contractor Submittals.

All submittals go to the Project Manager. (.PDF) documents and electronic storage devices are encouraged in lieu of hard copies. Submit copies as a complete document for each type submitted. Contractors may also use MDT's FTP site for documental submittals. Contact the Project Manager for information on using the FTP site and documents requiring signatures.

Submittals to Contract Plans and required as part of the bidding and award process are not included in this Table. Refer to Subsections 105.03.4 and 105.04 for more information.

The forms required below can be obtained from the MDT Internet Website (http://www.mdt.mt.gov/publications/forms/const_forms.shtml) or from the Project Manager.

SPECIFCATION REFERENCE	DESCRIPTION	TIMING
104.05.3	Approval of detour bridge	20 business days before starting the work
104.05.4(B)	Winter shutdown inspection (form MDT-CON-104-05-4)	3 calendar days after inspection
104.06.2	Encroachment permit (form MDT-MAI-007)	See Subsection 105.02
104.08	Value Engineering Proposal	Specified in proposal
105.02	Working drawings for required work not included in the contract plans	20 business days before starting work
105.08	Request for staking (form MDT-CON-105-08-1)	48 hours before staking
105.08.2(A)	Survey plan	14 calendar days prior to survey work
105.08.2(C)	Culvert length notes (form MDT-CON-603-03-1)	See Subsection 105.02
105.08.2(G)	Notes of layout, primary controls and references	10 business days upon completion of function
105.08.4	Original bridge survey notes	Upon request
105.08.4	Structure excavation cross section notes	24 hours before excavation
105.08.4	Corrections due to Contractor errors	2 business days before performing corrective work

SPECIFCATION REFERENCE	DESCRIPTION	TIMING
105.08.6	Notification of a completed section, to request finish grade check	The day a section is completed
105.15	Component inspection (form MDT-CON-105-15-1)	10 business days from inspection
105.16.1	Notice of claim (form MDT-CON-105-16-1A)	1 business day as described in Subsection 105.16.1
105.16.2	Submission of certified claim (form MDT-CON-105-16-2)	7 calendar days after response from Project Manager
105.17.1	Final walk-through request (form MDT-CON-105-17-1B)	See Subsection 105.17.1
	Final walk-through verification request (form MDT-CON-105-17-1D)	
105.17.2	Contractor's certificate of work complete (form MDT-CON-17-2)	See Subsection 105.17.2
106.01.1	Source of supply	20 business days before incorporating
106.02.2	Contractor/Landowner agreements	Before crushing or placing borrow
106.02.5(B)	Open Cut Mining Permit	Before removing regulated material
106.06	Documentation required by the QPL	Prior to incorporating into work
106.09	Domestic materials (form 406)	Before incorporation into work
107.06	Public safety	2 calendar days before starting that type of work
107.07(A)	Contractor's requirements and acknowledgement for working on RR ROW	Before entering or using RR ROW
107.08	Bridge formula calculations, drawing of axle spacing, tare weight and overall length of trucks	Before transporting material or equipment
107.11.1	Copies of approved environmental permits or authorizations	Before starting work requiring permit
	Correspondence to or from regulatory agencies	7 calendar days of sending or receiving noncompliance
107.11.2	404 Permit and/or SPA 124	3 copies; 60 calendar days before starting regulated work
	Tribal Water Quality Permit	3 copies; 60 calendar days before starting regulated work
107.11.2	Completed contractor's borrow source worksheet, when the project involves a U.S. Army Corps of Engineers Nationwide Permit.	Before placing borrow
	Montana DEQ for Clean Water Act Section 401 Certification, when project Involves a U.S. Army Corps of Engineers Nationwide Permit.	Concurrent with submittal to DEQ
107.22	Contractor furnished material sites outside of Department R/W	Concurrent with permitting process.
108.01.3	Payment information for all subcontractors to Civil Rights (https://app.mdt.mt.gov/spr//)	Within time frames stated in Special Provision

SPECIFCATION REFERENCE	DESCRIPTION	TIMING
108.03.1	Copies of completed applications for all permits, approvals, clearances	Upon receipt of notice of award
	Approved permits, reclamation plans, and clearances	Upon receipt of approved permits
	Request to perform night work	24 hours before starting work
108.03.2	Activities schedule chart / written narrative	Upon receipt of Notice of Award, and updates required in accordance with Subsection108.03.2
108.03.3	CPM electronic and printed schedule	Upon receipt of Notice of Award, and updates required in accordance with Subsection 108.03.2
	Electronic schedule monthly update	One week before the end of prior estimate cycle
108.07.3	Protest of time assessment	5 business days upon receipt of Time Assessment
108.07.5	Request for time extension	10 Business days from time of alleged delay
108.07.6	Request for delay compensation, daily records, reports, summaries	30 calendar days from time of alleged delay
108.08	Objections of the assessment of Liquidated Damages	Within 30 calendar days of receipt of Departments notification
108.10.2	Claim for termination costs	60 calendar days after termination date
109.11	Fuel price adjustments is optional, if participation is requested, submit the fuel price adjustment worksheet (form MDT-CON-109-11)	At the preconstruction conference or by Notice to Proceed Date, whichever comes first
201.03.5	Disposal location of non-salvageable treated timber	Upon request
201.03.5(A)	Approval of burning pit locations within ROW	
201.03.5(B)	Approval to incorporate non-hazardous solid material into the work	
202.03(B)	Removal or salvage of bridges	20 business days prior to removal
203.03.2(B)	Certified laboratory test for field cured cylinders	After 10-day cure or 70% strength
	Method to support structure / early embankment placement	Before early placement
204.03.1	Blasting Consultant	7 calendar days before the pre-construction conference
204.03.3	Master Blasting Plan (form MDT-CON-204-03-3)	Min. 10 business days before test or production operations.
204.03.3(A)	Report of Blasting (form MDT-CON-204-03-3A)	Min. 10 business days before test or production operations.
	Individual Production Blast Plan for subsequent blasts	Min. 4 business days prior to planned blast day
204.03.3(B)	Safety Plan	Min. 10 business days before test or production operations.
	Blast log, explosive consumption and loss report	Daily during blasting operations
204.03.3(B)9(b)	Contact list	Min. 10 business days before test or production operations

SPECIFCATION REFERENCE	DESCRIPTION	TIMING
204.03.5(C)	Misfires	Within 24 hours of blast
204.03.7(B)	Discrepancies	Submit with the Weekly Blasting Logs
204.03.9(A)	Drilling Logs	Daily
204.03.9(B)	Blasting Logs	Weekly
204.03.10(A)	Pre-Blast Condition Survey	Prior to the start of blasting operations
204.03.10(B)	Post Blast Condition Survey	Within 48 hours of completing the survey
204.03.10(C)	Vibration Control Monitoring	Min. 10 business days before test or production operations
206.03.3	Detour bridge design and calculations	20 business days before constructing detour bridge
207.03.6	Foundation preparation, use of CLSM	Min. 5 business prior to use
208.03	Completed SWPPP inspection reports	Per permit requirements
	Non-compliance reports (self-reporting) to DEQ and all related correspondence to and from DEQ	Within 14 calendar days of date of correspondence
208.03	Completed MPDES permit transfer package	3 copies; Within 14 calendar days of receipt of DEQ notification
208.03.2	signed NOI for the DEQ Stormwater Permit and NOI confirmation	3 copies; Before earth disturbing activities
	signed SWPPP for EPA Stormwater Permit and NOI confirmation	
208.03.2(D)	Erosion control plan	Before earth disturbing activities
208.03.3(C)	Bridge removal plans	45 calendar days before removal
209.03.3	Drawings and calculations for cofferdam and dewatering	20 business days before start of cofferdam work
	Request to increase seal depth	Before starting work
209.03.5	Footing rod soundings	Upon request
301.03.7	Traffic gravel- use of millings	Before starting placement
301.03.8	Aggregate treatment	
304.02.5	CTB mix design	10 business days before starting production
401.02.4	Additives for Warm mix	20 business days before warm mix production
401.03	Job mix targets (form MDT-CON-401-03)	Prior to 2000 tons production of plant mix,
401.03.1	Plant mix design	Min. 30 calendar days prior to production

SPECIFCATION REFERENCE	DESCRIPTION	TIMING
401.03.8	Approve weighing equipment	Upon request
401.03.10	use of EPA-UOF, certified test results	Per load delivered to the project
401.03.12	Calibration Checks with asphalt specific gravity test report	During calibration
401.03.13	Print of permanent record - submitted daily	Daily
401.03.18	Approval to pave between November 1st and April 15th	Before paving after November 1st
402.03.5	Acceptance of bituminous materials, bill of lading	Upon receipt of shipment
402.03.6	Temperature viscosity of each asphalt used on project	Before starting production
402.03.8	Notification of change to PGAB components	Before making changes
402.03.8(A)	PGAB shipping, handling & storage requirements	Before delivery
403.03.1	Blotter Material – type and application rate	10 calendar days before starting operations
409.01.1	Notification of seal coat work prior to July 4 and from August 21st through August 31st	Before starting work
409.02.1	Compatibility tests for each aggregate source	Before starting, for information only
409.03.2	Application rates, conditions and changes	Before starting, for information only
409.03.8	Detailed repair plan	14 calendar days of notification of required repairs
501.03.21	Accelerated paving techniques	7 calendar days before use
551.03.2(A)	Proposed concrete mix design (form MDT-MAT-008)	14 calendar days past year, 33 calendar days new
551.03.2(B)	Batching sequence for deck and overlay class concrete	Submit with mix design
551.03.2(E)	CLSM mix design	14 calendar days before start of production
551.03.3(A)	Quality Control	Upon request
551.03.6(A)	Hot weather concrete plan	15 calendar days prior to placement
551.03.6(B)	Cold weather concrete plan	15 calendar days prior to placement
551.03.6(B)(3)	Protection of concrete – temperature recording device	daily
551.03.7	Alternate curing methods	Before start of production
551.03.8(C)	Procedure to evaluate failed in-place concrete	3 calendar days of notification of required repairs
551.03.8(B)(4)	Concrete-small quantities - batch proportion sheet	Before start of production

SPECIFCATION REFERENCE	DESCRIPTION	TIMING
553.02.2	Reinforcing steel substitutions	Before starting production
553.02.4	Certified copy of typical load - elongation curves	Before starting production
553.03.1	Fabrication plant certification for pre-stressed concrete members	Min. 20 business days prior to production
553.03.1	Approval to change pre-stressing details	Refer to Subsection 105.02
553.03.2	Fabrication drawings and design	
553.03.3	Submit concrete mix design for girders	
553.03.7	Alternate pre-tensioning initial loading proposals	
	Elongation calculations	Before starting production
553.03.8(C)	Method of tensioning draped strands	Refer to Subsection 105.02
553.03.9(A)1	Concrete batch sheets	Before starting production
553.03.12	Post tensioning records	During production
554.03.1	Fabrication drawings-precast concrete products excludes box culverts	Refer to Subsection 105.02
554.03.2	Proposed mix design	Before starting fabrication. Refer to Subsection 551.03.2
554.03.6	Procedure for curing by other methods	Before use
555.03.2	Special fabrication or bends exceeding 90 degrees for #14S and #18S	Before fabrication
555.03.3	Request to weld reinforcing steel	Before starting placement
555.03.5	Shipping invoice	Each shipment & before placement
	Certified mill test reports	
	Fabricator certification statement for mill tests	
	Certificate of compliance for epoxy coating	
556.03.1	Modifications to quality assurance and control program	20 business days prior to beginning fabrication
556.03.2	Fabrication drawings for steel structures	Refer to Subsection 105.02
556.03.2(B)	Certificate of compliance, for all bolts, nuts and washers	Before placement into work
556.03.3(4)	Mill test reports	
556.03.5	Quality control plan	20 business days prior to fabrication

SPECIFCATION REFERENCE	DESCRIPTION	TIMING
556.03.8(B)(1)	Pre-installation verification	Before placement into work
556.03.12	Erection diagram	Each shipment
556.03.14	Steel erection plan	14 calendar days prior to construction of superstructure
556.03.15	Falsework plans	Refer to Subsection 105.02
557.03.1	Fabrication drawing for steel bridge railing	
558.03.1	Drilled shaft ASC and WN	20 business days before start of drilling
558.03.7	Field welding permanent casing	20 business days prior to welding
558.03.9	Obstruction removal	Within 2 business days of encountering obstruction
558.03.13	Concrete placement record	After completion of the pour
558.03.15(B)	Drilled shaft corrective action	14 calendar days after notification
559.02.1	Mill tests for steel piles	Each shipment & before driving
559.03.1(A)	Hammer manufacturers chart	20 business days before driving
	Calibrated chart	14 calendar days before use
559.03.2	Wave equation analysis	20 business days before driving
	Pile driving equipment (form MDT-CON-559-03-2)	
559.03.3(B)(1)	Plans for proposed loading system	20 business days before test
559.03.3(B)(2)	Pile specialty consultant resume (Dynamic Load testing)	20 business days before load testing
	Graph and report	Within 48 hours of completion of test
559.03.4	Plan for correcting pile out of alignment	Within 2 working days after driving
561.03.1	Bridge deck milling plan	14 calendar days before starting work
561.03.3	Hydrodemolition records and settings	Prior to beginning work
562.03.1	Bridge deck repair requirements	14 calendar days before starting work
562.03.6(A)	Description for sequence and equipment for repair concrete	
563.03.1	Modified concrete overlay submittals	10 business days before concrete placement
564.03	Corrective action - tolerances	Before proceeding after deficiency is found

SPECIFCATION REFERENCE	DESCRIPTION	TIMING
565.03.1	Bearing devices shop drawings	20 business days before fabrication
603.03.1	Optional pipe material	7 calendar days before the pre-construction conference
605.03.1	Fabrication submittals	10 business days before casting members
606.03.1	Manufacture's installation instruction for guardrail terminal sections and impact attenuators.	15 calendar days prior to installation, if requested
	Submit form MDT-CON-606-03	Prior to installing items
611.02.4	Fabrication drawings for cattle guards	20 business days before fabrication
612.02	Product data sheets	20 business days before starting work
612.03.1(A)	Description of coating system	
612.03.1(B)	Pollution controls (Per OSHA & EPA)	7 calendar days before the pre-construction conference
616.03.1	CLSM mix design for trenching	14 calendar days before start of production
617.03.2	Equipment list and drawings	20 business days before beginning work
617.03.17	Accessible pedestrian signals, voice message detail sheet	Submit with electrical submittals
618.03.2	Traffic control plan	7 calendar days before the pre-construction conference
618.03.2(A)	Documentation for NCHRP 350 or MASH requirements (form MDT-CON-618-02)	With the traffic control plan
618.03.2(A)(9)	Written narrative	7 calendar days before the pre-construction conference.
618.03.2(B)	Traffic control updates	As described in Subsection 618.03.2 B
618.03.4	Name of person responsible for traffic control	At the pre-con conference
618.03.6	Request for access break approval (form MDT-CON-618-03-6)	Before starting work
618.03.7(B)	Temporary crossing proposal	With traffic control plan and written narrative
618.03.13	Contractor's proposed speed limits (if different than Table 618-5)	5 calendar days before installation
619.03.2	Shop drawings / weld procedures/design calculations for, sign bridges, overhead cantilever sign structures, and overhead sign structural components and mounting hardware	Refer to Subsection 105.02
	Manufacturers installation instructions for square tubular sign posts	15 calendar days before installation
	Weld procedures, every 6 months or whenever changed or modified	Upon request
619.03.3	Manufacturer's installation instructions	15 calendar days before installation

SPECIFCATION REFERENCE	DESCRIPTION	TIMING
620.03.1	Manufacturer's material certifications	Before application
620.03.3	Calibration certification	
620.03.7(A)	Manufacturer’s instructions	24 hours before application
620.03.10	Proposed method for pavement marking removal	10 calendar days before use
622.02.2	Geotextile information	Before Installation
622.02.4	Manufacturer's certificate of compliance	Upon arrival on the project
622.03.1	Seam assembly description	With sample, before installation
623.02	NCHRP 350 or MASH compliant support certification	Before installation
624.03.3	Welding certification	20 business days before welding
701.11	Glass cullet certification	Upon request
704.01.10(C)	Manufacturer's certification	Each shipment, before application
707.03.2	Manufacturer's certification for rubber waterstops	Upon request
707.03.3	Manufacturer's certification	Each shipment, before application
709.02	Water tightness test method	Before testing
709.03	Supplier's itemized statement of plate sizes	Each shipment, before installation
710.02	Manufacturer’s MSDS	Before applying
710.03	Manufacturer’s certification for powder coating	
711.15	Manufacturer's certification for preformed joint seal	Before installation
711.16	Manufacturer's certification for fiber reinforced pads	
711.18	Mechanical rebar connectors product data sheet	
712.02.2	Certification that wire meets AASHTO M 280 requirements	
713.08	Written waiver, notification of seed source and approximate start date	Before application
713.11	Product data sheet	Before installation

MDT DETAILED DRAWINGS – SEPTEMBER 2014 EDITION SUPPLEMENTAL RELEASE (APRIL 2019) SUMMARY

Note: All Detailed Drawings have an Effective Date of September 2014, unless there is an effective date noted in the Supplemental column of the table below.

For more detailed information on these drawings or any of the drawings not listed, please e-mail: mdtdetaileddrawings@mt.gov or contact the Construction Engineering Services Bureau at (406) 444-0464. You may also contact the MDT/MSU Design Section at (406) 994-1859 for any inquiries or comments on the Detailed Drawings.

MDT Detailed Drawings – September 2014 Edition			
Detailed Drawing No.	**Supplemental Release Date**	**Detailed Drawing Title**	**Remarks**
TTL1	April 2019	Title Sheet	Update to reflect new supplemental release date.
TOC1	April 2019	Table of Contents	Update to reflect Dtl. Dwg's. changes.
TOC2	April 2019	Table of Contents	Update to reflect Dtl. Dwg's. changes.
TOC3	April 2019	Table of Contents	Update to reflect Dtl. Dwg's. changes.
TOC4	April 2019	Table of Contents	Update to reflect Dtl. Dwg's. changes.
TOC5	April 2019	Table of Contents	Update to reflect Dtl. Dwg's. changes.
TOC6	April 2019	Table of Contents	Update to reflect Dtl. Dwg's. changes.
TOC7	April 2019	Table of Contents	Update to reflect Dtl. Dwg's. changes.
101-05		Abbreviations	
101-06		Abbreviations	
101-07		Abbreviations	
101-08		Abbreviations	
101-10		Symbols	
203-05		Approaches	
203-20		Ditch Blocks	
~~208-00~~		~~Schedule of Best Management Practices~~	Rescinded (March 2017) – BMP Manual
~~208-04~~		~~Hydraulic Mulch (SS-3)~~	Rescinded (March 2017) – BMP Manual
~~208-08~~		~~Soil Binders (EC-5)~~	Rescinded (March 2017) – BMP Manual
~~208-10~~		~~Straw Mulch (EC-6)~~	Rescinded (March 2017) – BMP Manual
~~208-12~~		~~Rolled Erosion Control Products (EC-7)~~	Rescinded (March 2017) – BMP Manual
~~208-16~~		~~Earth Dikes/Drainage Swales & Lined Ditches (EC-9)~~	Rescinded (March 2017) – BMP Manual
~~208-18~~		~~Temporary Outlet and Velocity Dissipation Devices (EC-10)~~	Rescinded (March 2017) – BMP Manual
~~208-20~~		~~Temporary Slope Drains (EC-11)~~	Rescinded (March 2017) – BMP Manual
~~208-22~~		~~Slope Roughening (EC-12)~~	Rescinded (March 2017) – BMP Manual
~~208-26~~		~~Vegetated Buffer (EC-14)~~	Rescinded (March 2017) – BMP Manual
~~208-30~~		~~Silt Fence (SC-1)~~	Rescinded (March 2017) – BMP Manual
~~208-32~~		~~Design Basin (SC-2)~~	Rescinded (March 2017) – BMP Manual
~~208-34~~		~~Sediment Trap (SC-3)~~	Rescinded (March 2017) – BMP Manual
~~208-36~~		~~Check Dams (SC-4)~~	Rescinded (March 2017) – BMP Manual
~~208-38~~		~~Fiber Rolls (SC-5)~~	Rescinded (March 2017) – BMP Manual
~~208-40~~		~~Gravel Bag Berm (SC-6)~~	Rescinded (March 2017) – BMP Manual
~~208-42~~		~~Sand Bag Barriers (SC-8)~~	Rescinded (March 2017) – BMP Manual
~~208-44~~		~~Straw Bale Barriers (SC-9)~~	Rescinded (March 2017) – BMP Manual
~~208-46~~		~~Storm Drain Inlet Protection (SC-10)~~	Rescinded (March 2017) – BMP Manual
~~208-48~~		~~Dugout Ditch Basin (SC-11)~~	Rescinded (March 2017) – BMP Manual
~~208-56~~		~~Stabilized Construction Entrance/Exit (TC-1)~~	Rescinded (March 2017) – BMP Manual
~~208-58~~		~~Entrance/Exit Tire Wash (TC-3)~~	Rescinded (March 2017) – BMP Manual
~~208-60~~		~~Temporary Stream Crossings (NS-4)~~	Rescinded (March 2017) – BMP Manual
301-00		Roadway Embankment at Bridge End	
411-02	January 2018	Shoulder Rumble Strips	Shoulder Dimension
411-03	January 2018	Modified Shoulder Rumble Strips	New (January 2018)
411-05	April 2019	Centerline Rumble Strips	Depth/Span Table changes (Jan 2018) Spelling Error
501-00		PCCP Joints	

MDT Detailed Drawings – September 2014 Edition			
Detailed Drawing No.	**Supplemental Release Date**	**Detailed Drawing Title**	**Remarks**
501-05		PCCP Isolation Joints	
501-10		PCCP Isolation Joints	
501-15		PCCP Repair	
501-20		Dowel Bar Retrofit for PCCP	
501-25		Dower Bar Retrofit for PCCP	
552-00	January 2018	Concrete Cutoff Walls For Culverts	Updated culvert bedding and hydraulic standards.
552-04	January 2018	Concrete, Riprap and Bedding Material Quantities For Sing. and Dbl. Culvert Installation	Updated culvert bedding and hydraulic standards.
552-06	January 2018	Concrete, Riprap and Bedding Material Quantities For Sing. and Dbl. Culvert Installation	Updated culvert bedding and hydraulic standards.
552-08	January 2018	Concrete, Riprap and Bedding Material Quantities For Sing. and Dbl. Culvert Installation	Updated culvert bedding and hydraulic standards.
603-02		CMP Flared End Terminal Section (FETS)	
603-08		Prefabricated RCP Flared End Terminal Section (FETS)	
603-08		Prefabricated RCP Flared End Terminal Section (FETS) (Metric)	
603-10		Prefabricated RCP Arch Flared End Terminal Section (FETS)	
603-12		RCP Road Approach Culvert End Treatment (RACET)	
603-14		CMP Road Approach Culvert End Treatment (RACET)	
603-17		Precast Median U-Turn Cross Drain and Conc. Beveled End	
603-18	January 2018	Bedding for Mainline & Public Approach Culverts 48” (1200mm) Equivalent & Smaller	Updated culvert bedding and hydraulic standards.
603-19	January 2018	Bedding for Culverts 54” (1350 mm) Equivalent or Larger	Updated culvert bedding and hydraulic standards.
603-20	January 2018	Trench Bedding Detail	Updated culvert bedding and hydraulic standards.
603-22		Water Tight Joint For Reinforced Concrete Pipe	
603-24		Reinforced Concrete Pipe Joint	
603-26		Typical Field Cast Concrete Connections	
603-27		CTX Adapter	
603-28		Embankment Protector	
603-30	January 2018	Vehicular Underpass and Backfill Retainer & Cutoff Wall Detail	Updated culvert bedding and hydraulic standards.
603-30		Vehicular Underpass and Backfill Retainer & Cutoff Wall Detail (Metric)	
603-31		Vehicular Underpass PCCP Transverse Joint & Backfill Retainer Detail	
603-32	January 2018	Step Bevel For Circular Metal Culvert	Updated culvert bedding and hydraulic standards.
603-34	January 2018	Bevel on Arch Metal Culvert	Updated arch pipe areas. Updated culvert bedding and hydraulic standards.
603-36	January 2018	Corrugated Steel Pipe Stockpass	Updated culvert bedding and hydraulic standards.
604-00	January 2018	Median Inlet	Pipe Callout
604-02		Concrete Manhole	
604-03		Curb Inlet Type II	
604-04		Drop Inlet Type IV	
604-06		Type IV Drop Inlet With Slotted Drain	
604-08		Type II Curb Inlet With Slotted Drain	
604-14		Drop Inlets type I and V	
604-16		Drop Inlets Type III and VI	
604-18		Type A and B Curb Inlets	
605-00	March 2017	Concrete Barrier Rail	New (July 2016) – Moved from 606-60 Revised rebar structure.
605-05	March 2017	Concrete Barrier Rail Anchors	New (July 2016) – Moved from 606-62 Modified Note 1.

MDT Detailed Drawings – September 2014 Edition			
Detailed Drawing No.	**Supplemental Release Date**	**Detailed Drawing Title**	**Remarks**
605-10	March 2017	Tall Concrete Barrier Rail	New (July 2016) – Moved from 606-64 Revised rebar structure.
605-15	March 2017	Concrete Barrier Rail Transition	New (July 2016) – Moved from 606-66 Revised rebar structure.
605-20	March 2017	Concrete Barrier Rail Terminal Section (One-Way Departure)	New (July 2016) – Moved from 606-68 Revised rebar structure.
606-05A		~~Metal Guardrail Standard - Wood Posts~~	Modified for MGS W-Beam
	January 2018	Metal Guardrail – Wood Posts (MGS)	
606-05B		~~Metal Guardrail Standard - Steel Posts~~	Modified for MGS W-Beam
	January 2018	Metal Guardrail – Steel Posts (MGS)	
606-07		~~Stiffened Guardrail Sections~~	Modified for MGS W-Beam
	January 2018	Stiffened Guardrail Sections (MGS)	
606-09		~~Nested W-Beam Guardrail~~	Modified for MGS W-Beam (Jan 2018) Add Note 5
	April 2019	Long Span Guardrail (MGS)	
606-11A		~~Metal Guardrail – Long Posts (Wood)~~	Modified for MGS W-Beam
	January 2018	Metal Guardrail – Long Posts – Wood (MGS)	
606-11B		~~Metal Guardrail – Long Posts (Metal)~~	Modified for MGS W-Beam
	January 2018	Metal Guardrail – Long Posts – Steel (MGS)	
~~606-13A~~	~~July 2016~~	~~Optional Terminal Section - ET-PLUS~~	~~Note 10 was added to use routed wood blocks or other NCHRP 350 approved blocks~~
~~606-13B~~	~~July 2016~~	~~Optional Terminal Section - SKT 350~~	~~Note 9 was added to use routed wood blocks or other NCHRP 350 approved blocks~~
606-13	January 2018	MASH Optional Terminal Sections	New (January 2018)
606-18		~~One-Way Departure Terminal Section~~	Modified for MGS W-Beam
	January 2018	One-Way Departure Terminal Section (MGS)	
606-20	April 2019	MGS to Metal Guardrail Transition	New (January 2018) Linework for Bolt Pattern
606-23A	April 2019	MGS Thrie Beam Bridge Approach Section – Wood Posts	New (January 2018) Delete Note 5
606-23B	April 2019	MGS Thrie Beam Bridge Approach Section – Steel Posts	New (January 2018) Delete Note 5
606-24A	July 2016	Bridge Approach Sections - Wood Posts	STD. BIT. CURB was replaced with STD. CONC. CURB
606-24B	July 2016	Bridge Approach Sections - Steel Posts	STD. BIT. CURB was replaced with STD. CONC. CURB
606-25A		Skewed Bridge Approach Sections - Wood Posts	
606-25B		Skewed Bridge Approach Sections - Steel Posts	
606-26		Tapered Concrete Curb Detail	
606-27	July 2016	Tapered Concrete Curb Detail	Revised Class General Concrete Note
~~606-30A~~		~~Impact Attenuator - Quadguard~~	Rescinded (April 2019)
~~606-30B~~		~~Impact Attenuator - TRACC~~	Rescinded (April 2019)
~~606-30B~~		~~Impact Attenuator – TRACC (Metric)~~	Rescinded (April 2019)
~~606-30C~~		~~Impact Attenuator – Quest~~	Rescinded (April 2019)
~~606-30C~~		~~Impact Attenuator – Quest (Metric)~~	Rescinded (April 2019)
~~606-30D~~		~~Impact Attenuator - Quadguard II~~	Rescinded (April 2019)
~~606-31A~~		~~Impact Attenuator – Quadguard Assembly Details~~	Rescinded (April 2019)
~~606-31B~~		~~Impact Attenuator – TRACC Assembly Details~~	Rescinded (April 2019)
~~606-31B~~		~~Impact Attenuator – TRACC Assembly Details (Metric)~~	Rescinded (April 2019)
~~606-31C~~		~~Impact Attenuator – Quest Assembly Details~~	Rescinded (April 2019)
~~606-31C~~		~~Impact Attenuator – Quest Assembly Details (Metric)~~	Rescinded (April 2019)
~~606-31D~~		~~Impact Attenuator – Quadguard II Assembly Details~~	Rescinded (April 2019)
606-40		~~Cable Guardrail~~	Renamed Drawing
	January 2018	Low-Tension Cable Guardrail	
606-41		~~Cable Guardrail Terminal Anchor Assembly~~	Renamed Drawing
	January 2018	Low-Tension Cable Guardrail Terminal Anchor Assembly	
606-46		~~Intersecting Roadway Terminal Section~~	Modified for MGS W-Beam (Jan 2018) Omit bolt in center CRT per FHWA
	April 2019	Intersecting Roadway Terminal Section (MGS)	

MDT Detailed Drawings – September 2014 Edition			
Detailed Drawing No.	**Supplemental Release Date**	**Detailed Drawing Title**	**Remarks**
606-50		Box Beam Guardrail	
606-52		Box Beam One-Way Departure Terminal Section	
606-53		Box Beam Bridge Approach Section – Types 1 & 2	
606-53A		Box Beam Bridge Approach Section – Type 3	
606-54		Box Beam One-Way Bridge Departure Section	
606-55A		Optional Box Beam Terminal Section - WY-BET	
606-55B		Optional Box Beam Terminal Section - BEAT	
606-56A	July 2016	WY-BET Box Beam Terminal Section Details	Anchor assembly and section pay limits revised
606-56B	January 2018	BEAT Box Beam Terminal Section Details	Reference to Note 2
606-58	~~July 2016~~	~~Box Beam to W-Beam Transition Section~~	Revised 6:1 SLOPE BREAK LINE 10' label Modified for MGS W-Beam
	January 2018	Box Beam to W-Beam Transition Section (MGS)	
~~606-60~~		~~Concrete Barrier Rail~~	Rescinded (July 2016) – Moved to 605-00
~~606-62~~		~~Concrete Barrier Rail Anchors~~	Rescinded (July 2016) – Moved to 605-05
~~606-64~~		~~Tall Concrete Barrier Rail~~	Rescinded (July 2016) – Moved to 605-10
~~606-66~~		~~Concrete Barrier Rail Transition~~	Rescinded (July 2016) – Moved to 605-15
~~606-68~~		~~Concrete Barrier Rail Terminal Section (One-Way Departure)~~	Rescinded (July 2016) – Moved to 605-20
606-80	January 2018	Schedule of Guardrail Hardware	Modified for MGS W-Beam
606-82		Guardrail Hardware	
606-84		W-Beam Metal Guardrail Hardware	
606-88	April 2019	W-Beam Metal Guardrail Hardware	Additional part numbers
606-92		~~Cable Guardrail Hardware~~	
	January 2018	Low-Tension Cable Guardrail Hardware	
606-94		~~Cable Guardrail Hardware~~	
	January 2018	Low-Tension Cable Guardrail Hardware	
606-95		~~Cable Guardrail Hardware~~	
	January 2018	Low-Tension Cable Guardrail Hardware	
606-97		Box Beam Guardrail Hardware	
606-98		Box Beam Guardrail Hardware	
606-99		Box Beam Guardrail Hardware	
607-00		Farm Fence	
607-01		Wildlife Friendly Fence	
607-02		Farm Entrance Gates	
607-05	January 2018	Fence Details	Added Metal Panel
607-10		Fence Details	
607-15		Fence Details	
607-17	January 2018	Fence Details	New (January 2018) – Stock Pass
607-20	July 2016	Fencing at Right of Way Breaks	Revised treated 2x6's and added 3-inch exterior grade screws.
607-25	July 2016	Chain Link Fence	Tensioner and brace band removed lower tension wire.
607-30		8' (2.4 m) Wood Snow Fence W/ Anchor System #1	
607-35		12' (3.6 m) Wood Snow Fence W/ Anchor System #1	
607-40		Wood Snow Fence Anchor System #3 and #1 Details	
607-45		Wood Snow Fence Anchor System #2 Details	
607-50		Wildlife Fence	
607-55		Jackleg Wire Fence	
607-60		Jackleg Pole Fence	
608-05	April 2019	Concrete Sidewalk	Vehicle approach detail angle fillets in boulevard like one above ADA Process Review
608-15	April 2019	New Construction Public Sidewalk Curb Ramps	ADA Process Review

MDT Detailed Drawings – September 2014 Edition			
Detailed Drawing No.	**Supplemental Release Date**	**Detailed Drawing Title**	**Remarks**
~~608-20~~		~~Alterations to Existing Facilities - Public Sidewalk Curb Ramps~~	Rescinded (April 2019) ADA Process Review
608-25	April 2019	Perpendicular Public Sidewalk Curb Ramps	ADA Process Review
608-30	April 2019	Parallel Public Sidewalk Curb Ramps	ADA Process Review
608-35	April 2019	Diagonal Perpendicular Public Sidewalk Curb Ramps	ADA Process Review
608-40	April 2019	Detectable Warning Devices	ADA Process Review
609-00	July 2016	Concrete Valley Gutter	Revised to show epoxy coated reinforcing bars.
609-05	April 2019	Miscellaneous Curbs	ADA Process Review
609-07	July 2016	Drop Inlet Aprons	Revised to show epoxy coated reinforcing bars.
609-10		Median Concrete Curbs	
609-12		Concrete Median Caps	
610-00		Topsoil and Seeding	
610-05		~~Turf Reinforcement Mat (TRM) and Rolled Erosion Control (REC)~~	Renamed Drawing
	July 2016	Rolled Erosion Control (REC)	
611-00	July 2016	Heavy Duty Cattle Guard Cast-in-Place	Revised SECTION D and added “Heavy Duty” to title.
611-03	July 2016	Cattle Guard Hinged Grate	New (July 2016)
611-05		Cast-in-Place Cattle Guard Rebar Details	
611-10		Light Duty Cattle Guard Precast	
611-10		Light Duty Cattle Guard Precast (Metric)	
611-15		Heavy Duty Cattle Guard - Precast	
611-20		Precast Concrete Cattle Guard Base Details	
613-06	January 2018	Concrete Edge Protection For Metal Culverts	Updated culvert bedding and hydraulic standards.
613-08	January 2018	Concrete Edge Protection For Concrete Culverts	Updated culvert bedding and hydraulic standards.
613-10		Concrete Slope Protection	
613-12		Inlet and Outlet Headwalls For RCP and CMP Pipes	
613-14	January 2018	Culvert Riprap	Updated culvert bedding and hydraulic standards.
613-16		~~Embankment Protection~~	Renamed Drawing
	July 2016	Riprap Slope Protection	
613-18		Drainage Chutes	
615-02		Trashguard For Concrete Irrigation Inlet and Outlet Transition Structures	
615-04		Standard Concrete Irrigation Division Boxes	
615-06		Concrete Irrigation Inlet and Outlet Transition For RCP and CSP Pipes	
618-00	July 2016	Channelizing Devices and Object Markers	Changed to 28-inch minimum for flexible guide post.
618-01		Construction Sign Details	
618-02		Portable Sign Support Assembly	
618-03		Barricades	
618-04	October 2017	Two-Lane Construction Project	Sign layout regarding Fines Double sign.
618-08	October 2017	Two-Lane Construction Project Work Zones	Sign layout regarding Fines Double sign.
618-10	October 2017	Two-Lane Construction Project Seal Coat	Sign layout regarding Fines Double sign.
618-12	October 2017	Two-Lane Construction Project Lane Closure – Flagger Controlled	Sign layout regarding Fines Double sign.
618-13	October 2017	Two-Lane Construction Project Lane Closure – Signal Controlled	Sign layout regarding Fines Double sign.
618-14	October 2017	Two-Lane Equipment Entrances	Sign layout regarding Fines Double sign.
618-16	October 2017	Two-Lane Equipment Entrances	Sign layout regarding Fines Double sign.
618-18	October 2017	Two-Lane Construction Project Diversion	Sign layout regarding Fines Double sign.
618-20	October 2017	Divided Four-Lane Construction Project	Sign layout regarding Fines Double sign.
618-21	October 2017	Temporary Entrance Ramp Median Crossing	Sign layout regarding Fines Double sign.
618-22	October 2017	Temporary Exit Ramp Median Crossing	Sign layout regarding Fines Double sign.

MDT Detailed Drawings – September 2014 Edition			
Detailed Drawing No.	**Supplemental Release Date**	**Detailed Drawing Title**	**Remarks**
618-24	October 2017	Divided Four-Lane Construction Project Work Zones	Sign layout regarding Fines Double sign.
618-27	October 2017	Divided Four-Lane Equipment Entrance	Sign layout regarding Fines Double sign.
618-28	October 2017	Divided Four-Lane Median Crossings	Sign layout regarding Fines Double sign.
618-30	October 2017	Temporary Four-Lane to Two-Lane Median Crossing	Changed legend regarding raised rigid pavement markers. Sign layout regarding Fines Double sign.
618-32	October 2017	Temporary Two-Lane to Four-Lane Median Crossing	Changed legend regarding raised rigid pavement markers. Sign layout regarding Fines Double sign
618-33	October 2017	Divided Four-Lane Single Lane Closure Lane Shift	New (July 2016) Sign layout regarding Fines Double sign
618-34	April 2019	Short Duration or Short-Term Stationary Crew Signing	Sign layout regarding Fines Double sign
618-M1	October 2017	Maintenance Guideline For Short-Term Two-Lane Crack Sealing Work Zone	Sign layout regarding Fines Double sign
618-M2	October 2017	Maintenance Guideline For Short-Term Two-Lane Chip Seal & Overlay (Piloted Traffic)	Sign layout regarding Fines Double sign
618-M3	October 2017	Maintenance Guideline For Short-Term Lane Closure on Interstate	Sign layout regarding Fines Double sign
618-M4	October 2017	Mobile Operations	Sign layout regarding Fines Double sign
618-U01	October 2017	Lane Closure- Flagger Controlled (Urban Two-Lane, Two-Way Road)	Sign layout regarding Fines Double sign
618-U02	October 2017	Work Zone Occupies one Half of the Road (Low Speed Urban, Two-Lane, Two-Way Road)	Sign layout regarding Fines Double sign
618-U03	October 2017	Work Zone in the Center of the Road (Urban Two-Lane, Two-Way Road)	Sign layout regarding Fines Double sign
618-U05	October 2017	Sidewalk Closures and Bypass Walkway	Sign layout regarding Fines Double sign
618-U10	October 2017	Crosswalk Closures and Pedestrian Detours	Sign layout regarding Fines Double sign
618-U15	October 2017	Lane Closure (Urban Two-Lane, Two-Way Road with Two-Way Left Turn Lane)	Sign layout regarding Fines Double sign
618-U16	October 2017	Turn Lane Closure (Urban Two-Lane, Two-Way Road with Two-way Left Turn Lane)	Sign layout regarding Fines Double sign
618-U20	October 2017	Right Lane Closure (Urban Multi-Lane, Undivided Road)	Sign layout regarding Fines Double sign
618-U25	October 2017	Left Lane Closure (Low Speed Urban Multi-Lane, Undivided Road)	Sign layout regarding Fines Double sign
618-U30	October 2017	Left Lane Closures (Low Speed Urban Multi-Lane, Undivided Road)	Sign layout regarding Fines Double sign
618-U35	October 2017	Double Lane Closure (Urban Multi-Lane, Undivided Road)	Sign layout regarding Fines Double sign
618-U40	October 2017	Right Lane Closure – Work Zone Beyond Intersection (Urban Multi-Lane, Undivided Road)	Sign layout regarding Fines Double sign
618-U45	October 2017	Left Lane Closure – Work Zone Beyond Intersection (Urban Multi-Lane, Undivided Road)	Sign layout regarding Fines Double sign
618-U50	October 2017	Double Lane Closure at Intersection (Urban Multi-Lane, Undivided Road)	Sign layout regarding Fines Double sign
618-U60	October 2017	Left Lane Closure (Urban Low Speed, Multi-Lane Undivided Road with Two-Way Left Turn Lane)	Sign layout regarding Fines Double sign
619-00		Sign Clearances and Mounting Heights	
619-00		Sign Clearances and Mounting Heights (Metric)	
619-02		Typical Rural and Urban Approaches	
619-04		Aluminum Sheet Increment Sign Construction Details	
619-06		Plywood Sheet Increment Guide Sign Construction Details	
619-08		Guide Sign Clearance and Mounting Details	
619-10		Sheet Aluminum Overlay	
619-12		Tubular Sign Post Details	
619-13		Breakaway and Foundation Details For Multiple Guide Sign Supports	
619-13		Breakaway and Foundation Details For Multiple Guide Sign Supports (Metric)	
619-14	July 2014	Square Tubular Sign Post Breakaway Devices	Revised SUPPORT and CORRESPONDING ANCHOR table
619-16		Typical Steel Post Mounting Details	

MDT Detailed Drawings – September 2014 Edition			
Detailed Drawing No.	**Supplemental Release Date**	**Detailed Drawing Title**	**Remarks**
619-18		Cantilever Type Sign Support Details For Sidewalk Areas	
619-19		Structural Steel Post Sign Mounting Details	
619-20		Treated Wood Pole Sign Mounting and Support Details	
619-21		Treated Wood Pole Sign Mounting Details	
619-22		Treated Wood Pole Optional Backbrace	
619-24		Chevron Mounting Details	
619-26		Special Design Route Marker Panels and Shields	
619-30		Sign Hinge Details	
619-32		Milepost (Reference Post) Details	
619-34		Delineator Details	
619-36		Delineator Placement Details	
619-38		Object Marker Design and Placement Details For Obstructions Adjacent to or Within Highways	
619-40		Flexible Delineators	
619-42		Permanent Barricade Design Details	
619-44		Installation Date Tags	
620-00		Pavement Markings (Letters)	
620-05		Pavement Markings (Numbers)	
620-10		Pavement Markings (Words)	
620-15		Pavement Markings (Arrows)	
620-20	July 2016	Pavement Markings (Symbols)	Revised accessibility parking space areas and added note to use standard symbol unless contract states otherwise.
620-25		Pavement Markings (Symbols)	
620-30	April 2019	Pavement Markings (Centerline Rumble Striping)	
621-00		Manhole and Valve Box Adjustment Details	
621-05		Optional Manhole and Valve Box Adjustment Details	
623-10		Approach Mailbox Turnout	
623-15		Mailbox Turnout	
623-20		Mailbox Detail	
623-25		Optional Mailbox Detail	
623-30		Temporary Mailbox Support	
623-35		Temporary Mailbox Support Bracket Details	
900-00		U-Turn Median Openings on Controlled Access Highways	
900-15	July 2016	Adjustable Monument Box	Revised Note 3 regarding the requirements of a Montana Licensed Professional Land Surveyor.

CURRENT DATE OF REVISION
MT 100 SECTION
CONCRETE

Test Method No.	Title	Pages	Date of Publication or Revision
MT 100	Contractor Submitted Concrete Mix Design	3 pp	Dec 2017
MT 101	Making and Curing Compressive and Flexural Strength Test Specimens in the Field	1 pp	Dec 2015
MT 102	Eliminated *(Use AASHTO T 152 Air Content of Freshly Mixed Concrete by the Pressure Method)*		
MT 103	Measuring the Thickness of In-Place Concrete by Use of Concrete Thickness Gauge	3 pp	Mar 2007
MT 104	Eliminated *(Use AASHTO T 119 Slump of Hydraulic Cement Concrete)*		
MT 105	Eliminated *(Use AASHTO R 60 Sampling Freshly Mixed Concrete)*		
MT 106	Eliminated *(Use AASHTO T 148 Measuring Length of Drilled Concrete Cores)*		
MT 107	Eliminated *(Use AASHTO T 196 Air Content of Freshly Mixed Concrete by the Volumetric Method)*		
MT 108	Sampling and Certification of Portland Cement	2 pp	Jun 2004
MT 109	Method for Sampling Water	1 pp	Jun 2004
MT 110	Reinforced Concrete Pipe and Other Precast Items	4 pp	Jan 2012
MT 111	Sampling, Inspection and Reporting on Prestressed Structural Members	3 pp	Jan 2012
MT 112	Eliminated *(Use AASHTO T 24 Obtaining and Testing Drilled Cores and Sawed Beams of Concrete)*		
MT 113	Eliminated *(Use ASTM E965 Measuring Pavement Macrotexture Depth Using a Volumetric Technique)*		
MT 114	Sampling for Chloride Content of Bridge Deck Concrete	3 pp	Feb 2010
MT 115	Eliminated *(Use AASHTO T 121 Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete)*		
MT 116	Eliminated *(Use AASHTO T 347 Slump Flow of Self-Consolidating Concrete (SCC))*		
MT 117	Making and Curing Concrete Compressive and Flexural Strength Specimens in the Field for Self-Consolidating Concrete (SCC)	1 pp	Jun 2017
MT 118	Eliminated *(Use AASHTO T 152 Air Content of Freshly Mixed Concrete by the Pressure Method)*		
MT 119	Moisture Correction for Concrete Mix Designs (formerly MT 506)	1 pp	Jun 2004
MT 120	Vacant		
MT 121	Effect of Organic Impurities in Fine Aggregate on Strength of Mortar	1 pp	Jun 2016
MT 122	Optimized Aggregate Gradation for Hydraulic Cement Concrete Mix Designs (formerly MT 215)	6 pp	Jan 2017

CURRENT DATE OF REVISION
MT 200 SECTION
SOIL AND AGGREGATE

Test Method No.	Title	Pages	Date of Publication or Revision
MT 200	Vacant *(Use AASHTO R 58 Dry Preparation of Disturbed Soil and Soil-Aggregate Samples for Test)*		
MT 201	Sampling Roadway Materials	7 pp	Oct 2013
MT 202	Sieve Analysis for Fine and Coarse Aggregate	9 pp	Nov 2011
MT 203	Eliminated *(Use AASHTO T 19 Bulk Density (Unit Weight) and Voids in Aggregate)*		
MT 204	Eliminated *(Use AASHTO T 84 Specific Gravity and Absorption of Fine Aggregate)*		
MT 205	Eliminated *(Use AASHTO T 85 Specific Gravity and Absorption of Coarse Aggregate)*		
MT 206	Vacant (ELIMINATED)		
MT 207	Centerline Soil Survey	10 pp	Jun 2004
MT 208	Eliminated *(Use AASHTO T 89 Determining the Liquid Limit of Soils and AASHTO T 90 Determining the Plastic Limit and Plasticity Index of Soils)*		
MT 209	Eliminated *(Use AASHTO T 96 Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine)*		
MT 210	Moisture-Density Relations of Soils Using 5.5 lb. Rammer and 12 In. Drop	1 pp	Dec 2016
MT 211	Eliminated *(Use AASHTO T 134 Moisture-Density Relations of Soil-Cement Mixtures)*		
MT 212	Determination of Moisture and Density of In-Place Materials	5 pp	Sep 2018
MT 213	Eliminated *(Use AASHTO T 176 Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test)*		
MT 214	Eliminated *(Use AASHTO M 145 Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes)*		
MT 215	Vacant (moved to MT 122)		
MT 216	Method of Sampling and Testing Cement Treated Base	5 pp	Oct 2013
MT 217	Eliminated *(Use AASHTO T 335 Determining the Percentage of Fracture in Coarse Aggregate)*		
MT 218	Determining Relative Compaction and Percent Moisture	2 pp	Jun 2004
MT 219	Controlling Compaction Using a Control-Strip Test-Section Technique with Nuclear Gauges	3 pp	Aug 2019
MT 220	Eliminated *(Use AASHTO T 100 Specific Gravity of Soils)*		
MT 221	Eliminated *(Use AASHTO T 255 Total Evaporable Moisture Content of Aggregate by Drying)*		
MT 222	Eliminated *(Use AASHTO T 191 Density of Soil In-Place by the Sand-Cone Method)*		
MT 223	Eliminated *(Use AASHTO T 112 Clay Lumps and Friable Particles in Aggregate)*		
MT 224	Vacant (ELIMINATED)		
MT 225	Vacant (ELIMINATED)		
MT 226	Maximum Acceptable Deviations in Sieve Analysis of IA Samples	1 pp	Dec 2016
MT 227	Eliminated *(Use AASHTO T 265 Laboratory Determination of Moisture Content of Soils)*		

CURRENT DATE OF REVISION
MT 200 SECTION
SOIL AND AGGREGATE

Test Method No.	Title	Pages	Date of Publication or Revision
MT 228	Method of Establishing Field Target Density for Cement Treated Base Density Control	1 pp	Oct 2013
MT 229	Procedure for Solids-Water-Voids Relations of Soil Masses	12 pp	Sep 2015
MT 230	Moisture-Density Relation of Soils Using a 10 lb Rammer and 18 In. Drop	1 pp	Dec 2016
MT 231	Vacant (ELIMINATED)		
MT 232	Soil Corrosion Test	3 pp	Dec 2016
MT 233	Eliminated *(Use AASHTO T 327 Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus)*		

CURRENT DATE OF REVISION
MT 300 SECTION
HOT MIX PAVEMENT

Test Method No.	Title	Pages	Date of Publication or Revision
MT 301	Vacant		
MT 302	Sampling and Testing Bituminous Materials	2 pp	Jul 2014
MT 303	Sampling Bituminous Paving Mixtures	3 pp	Jul 2014
MT 304	Moisture Test on Plant Mix Bituminous Surfacing Aggregates	2 pp	Jul 2014
MT 305	Volume Swell of Bituminous Mixtures	6 pp	May 2009
MT 306	Vacant		
MT 307	Vacant		
MT 308	Vacant		
MT 309	Eliminated *(Use AASHTO R 47 Reducing Samples of Hot Mix Asphalt to Testing Size)*		
MT 310	Determining the Macro-Texture of a Pavement Surface	6 pp	Dec 2017
MT 311	Vacant		
MT 312	Eliminated *(Use AASHTO T 329 Moisture Content of Asphalt Mixtures by Oven Method)*		
MT 313	Vacant		
MT 314	Eliminated *(Use AASHTO T 166 Bulk Specific Gravity (Gmb) of Compacted Asphalt Mixtures Using Saturated Surface-Dry Specimens)*		
MT 315	Vacant		
MT 316	Method of Sampling Recycled Pavement and Field Control of Recycle Paving	5 pp	Jun 2004
MT 317	Vacant		
MT 318	Vacant		
MT 319	Determining the Asphalt Binder Content of Plant Mix Surfacing (PMS) by the Ignition Method	6 pp	Sep 2017
MT 320	Mechanical Analysis of Aggregate Recovered from Ignition Oven Burn	1 pp	Jun 2017
MT 321	Determining Theoretical Maximum Specific Gravity of Bituminous Paving Mixtures - "Rice Gravity"	4 pp	Jun 2017
MT 322	Method of Determining the Percent of Adhesion of Bituminous Materials to Aggregate	2 pp	Oct 2004
MT 323	Vacant		
MT 324	Vacant		
MT 325	Vacant (ELIMINATED)		
MT 326	Vacant		
MT 327	Vacant		

CURRENT DATE OF REVISION
MT 300 SECTION
HOT MIX PAVEMENT

Test Method No.	Title	Pages	Date of Publication or Revision
MT 328	Establishing Field Target Density for Plant Mix Surfacing Density Control	1 pp	Jul 2014
MT 329	Procedure for Evaluating Plant Mix Surfacing Failures	5 pp	Jun 2004
MT 330	Vacant		
MT 331	Sampling and Evaluating Stripping Pavements	7 pp	Jul 2014
MT 332	Gyratory Compaction of Bituminous Mixtures.	2 pp	Jun 2017
MT 333	Method of Test for the Torsional Recovery of Latex Modified Asphalt Emulsion Residue	3 pp	Jun 2004
MT 334	Method of Test for Hamburg Wheel-Track Testing of Compacted Bituminous Mixtures	4 pp	Dec 2017
MT 335	Linear Kneading Compaction of Bituminous Mixtures	2 pp	Jul 2014
MT 336	Vacant		
MT 337	Vacant (ELIMINATED)		
MT 338	Eliminated *(Use ASTM D6390 Determination of Draindown Characteristics in Uncompacted Asphalt Mixtures*)		

CURRENT DATE OF REVISION
MT 400 SECTION
MISCELLANEOUS MATERIALS AND TEST METHODS

CURRENT DATE OF REVISION
MT 500 SECTION
CHEMISTRY

Test Method No.	Title	Pages	Date of Publication or Revision
MT 501	pH, Insoluble Materials, Corrosion Rate, Percent Settleable Solids and Percent Passing a #10 Sieve of Brine Materials	1 pp	Jun 2016
MT 502	Elemental Chemical Analysis Of Brine Materials	7 pp	Sep 2016
MT 503	Vacant		
MT 504	Cyanide In Brine Material		Under Development
MT 505	Vacant		
MT 506	Vacant		
MT 507	Vacant		
MT 508	Vacant		
MT 509	Vacant		
MT 510	Vacant		
MT 511	Vacant		
MT 512	Vacant		
MT 513	Vacant		
MT 514	Vacant		
MT 515	Vacant		
MT 516	Vacant		
MT 517	Vacant		
MT 518	Vacant		
MT 519	Vacant		
MT 520	Determination of Wear Metals in Engine Oil		Under Development
MT 521	Determination of Red Dye #26 in Diesel Fuel	1 pp	Sep 2016
MT 522	Vacant		
MT 523	Vacant		
MT 524	Vacant		
MT 525	Mechanical Rocker Test for Ice Melting Capacity for Deicing Material	5 pp	Aug 2019
MT 526	Moisture Analysis of PNS Category 8A, 8B, and 8C Solid Sodium Chloride	2 pp	Jun 2016
MT 527	Vacant		
MT 528	Vacant		
MT 529	Vacant		

CURRENT DATE OF REVISION
MT 500 SECTION
CHEMISTRY

Test Method No.	Title	Pages	Date of Publication or Revision
MT 530	Determination of Chloride in Bridge Deck Cement by Ion Chromatography	5 pp	Dec 2016
MT 531	Vacant		
MT 532	Determination of Sulfate Content in Soils by Ion Chromatography	4 pp	Dec 2016
MT 533	Chemical Analysis of Fly Ash and Pozzolans	9 pp	Sep 2016
MT 534	Chemical Analysis of Portland Cement	8 pp	Jun 2016
MT 535	Bridge Deck Crack Sealant IR Test		Under Development
MT 536	Chemical Analysis of Silica Fume	1 pp	Jun 2016
MT 537	Chemical Analysis of Ground Granulated Blast-Furnace Slag (GGBFS)	4 pp	Sep 2016
MT 538	Chemical Analysis of Blended Cement	9 pp	Sep 2018
MT 539	Vacant		
MT 540	Vacant		
MT 541	Vacant		
MT 542	Vacant		
MT 543	Vacant		
MT 544	Vacant		
MT 545	Vacant		
MT 546	Vacant		
MT 547	Vacant		
MT 548	Analysis of Traffic Paint	7 pp	Jun 2016

CURRENT DATE OF REVISION
MT 600 SECTION
INFORMATION AND FIELD SAMPLING PROCEDURES

FHWA-1273 -- Revised May 1, 2012

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

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.

2. **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.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

Supplemental Revisions for FHWA Form-1273 (Dated May 1, 2012)
Required Contract Provisions
Federal-Aid Construction Contracts

The following are supplementary or amendatory to the May 1, 2012, FHWA Form-1273 insofar as they apply to this contract:

Add the following provisions in accordance with the FHWA memo dated December 11, 2015:

Utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

Furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in above paragraph to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

MDT NONDISCRIMINATION
AND
DISABILITY ACCOMMODATION NOTICE

Rev. 01/2019

Montana Department of Transportation ("MDT") is committed to conducting all of its business in an environment free from discrimination, harassment, and retaliation. In accordance with State and Federal law MDT prohibits any and all discrimination and protections are all inclusive (hereafter "protected classes") by its employees or anyone with whom MDT does business:

Federal protected classes	State protected classes
Race, color, national origin, sex, sexual orientation, gender identity, age, disability, & Limited English Proficiency	Race, color, national origin, parental/marital status, pregnancy, childbirth, or medical conditions related to pregnancy or childbirth, religion/ creed, social origin or condition, genetic information, sex, sexual orientation, gender identification or expression, national origin, ancestry, age, disability mental or physical, political or religious affiliations or ideas, military service or veteran status

For the duration of this contract/agreement, the PARTY agrees as follows:

(1) Compliance with Regulations: The PARTY (hereinafter includes consultant) will comply with all Acts and Regulations of the United States and the State of Montana relative to Non-Discrimination in Federally and State-assisted programs of the U.S. Department of Transportation and the State of Montana, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

(2) Non-discrimination:

a. The PARTY, with regard to the work performed by it during the contract, will not discriminate, directly or indirectly, on the grounds of any of the protected classes in the selection and retention of subcontractors, including procurements of materials and leases of equipment, employment, and all other activities being performed under this contract/agreement.
b. PARTY will provide notice to its employees and the members of the public that it serves that will include the following:
    i. Statement that PARTY does not discriminate on the grounds of any protected classes.
    ii. Statement that PARTY will provide employees and members of the public that it serves with reasonable accommodations for any known disability, upon request, pursuant to the Americans with Disabilities Act as Amended (ADA).
    iii. Contact information for PARTY's representative tasked with handling non-discrimination complaints and providing reasonable accommodations under the ADA.

iv. Information on how to request information in alternative accessible formats.

c. In accordance with Mont. Code Ann. § 49-3-207, PARTY will include a provision, in all of its hiring/subcontracting notices, that all hiring/subcontracting will be on the basis of merit and qualifications and that PARTY does not discriminate on the grounds of any protected class.

(3) Participation by Disadvantaged Business Enterprises (DBEs):

a. If the PARTY receives federal financial assistance as part of this contract/agreement, the PARTY will make all reasonable efforts to utilize DBE firms certified by MDT for its subcontracting services. The list of all currently certified DBE firms is located on the MDT website at mdt.mt.gov/business/contracting/civil/dbe.shtml

b. By signing this agreement, the PARTY assures that:

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.

c. PARTY must include the above assurance in each contract/agreement the PARTY enters.

(4) Solicitation for Subcontracts, Including Procurement of Materials and Equipment: In all solicitations, either by competitive bidding, or negotiation, made by the PARTY 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 PARTY of the PARTY's obligation under this contract/agreement and all Acts and Regulations of the United States and the State of Montana related to Non-Discrimination.

(5) Information and Reports: The PARTY will provide all information and reports required by the Acts, 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 MDT or relevant US DOT 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 the information, the PARTY will so certify to MDT or relevant US DOT Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

(6) Sanctions for Noncompliance: In the event of a PARTY's noncompliance with the Non- discrimination provisions of this contract/agreement, MDT will impose such sanctions as it or the relevant US DOT Administration may determine to be appropriate, including, but not limited to:

a. Withholding payments to the PARTY under the contract/agreement until the PARTY complies; and/or

b. Cancelling, terminating, or suspending the contract/agreement, in whole or in part.

(7) Pertinent Non-Discrimination Authorities:

During the performance of this contract/agreement, the PARTY, for itself, its assignees, and successor in interest, agrees to comply with the following non-discrimination statues and authorities; including but not limited to:

Federal

- 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, (23 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 Airways 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 programs 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 prohibits 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 CFR 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 prevents 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 programs (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 (20 U.S.C. § 1681 *et seq.*).

- Executive Order 13672 prohibits discrimination in the civilian federal workforce on the basis of gender identity and in hiring by federal contractors on the basis of both sexual orientation and gender identity.

State

- Mont. Code Ann. § 49-3-205 Governmental services;

- Mont. Code Ann. § 49-3-206 Distribution of governmental funds;

- Mont. Code Ann. § 49-3-207 Nondiscrimination provision in all public contracts.

(8) Incorporation of Provisions: The PARTY will include the provisions of paragraph one through seven in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and/or directives issued pursuant thereto. The PARTY will take action with respect to any subcontract or procurement as MDT or the relevant US DOT Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the PARTY becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the PARTY may request MDT to enter into any litigation to protect the interests of MDT. In addition, the PARTY may request the United States to enter into the litigation to protect the interests of the United States.

SPECIAL PROVISIONS
Rev. 3-15-02
EEO AFFIRMATIVE ACTION REQUIREMENTS ON
FEDERAL & FEDERAL-AID CONSTRUCTION CONTRACTS

Federal-aid contractors are hereby notified they are subject to the OFCCP goals and timetables for minority and female participation expressed below. Compliance with the goals and OFCCP affirmative action efforts for contracts and subcontracts consisting of $10,000 or more will be determined by OFCCP officials.

APPENDIX 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 "Standard Federal Equal Employment Opportunity Construction Contract 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:

GOALS FOR FEMALE PARTICIPATION EACH TRADE	6.9%
TIMETABLES	GOALS FOR MINORITY PARTICIPATION IN EACH TRADE
153 Great Falls, MT	
SMSA (Standard Metropolitan Statistical Area) Counties	
3040 Great Falls, MT	3.2%
Cascade County	
Non-SMSA Counties	4.1%
Blaine, Broadwater, Chouteau, Fergus, Glacier, Hill, Jefferson, Judith Basin, Lewis & Clark, Liberty, Meagher, Petroleum, Phillips, Pondera, Teton, Toole, Valley, Wheatland	
154 Missoula, MT	
Non-SMSA Counties	2.7%
Beaverhead, Deer Lodge, Flathead, Granite, Lincoln, Madison, Mineral, Lake Missoula, Powell, Ravalli, Sanders, Silver Bow	
155 Billings, MT	
SMSA Counties	
0880 Billings, MT	3.3%
Yellowstone County	
Non-SMSA Counties	3.3%
Big Horn, Carbon, Carter, Custer, Dawson, Fallon, Gallatin, Garfield, Golden Valley, McCone, Musselshell, Park, Powder River, Prairie, Rosebud, Stillwater, Sweet Grass, Treasure, Wibaux, Yellowstone Nat'l Park	
Non-SMSA Counties	
Daniels, Sheridan, Richland, Roosevelt	4.4%

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 nonfederally 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.

For future updates, please refer to the MDT website at http://www.mdt.mt.gov/. Once at the site, click on Doing Business tab, then Contracting and Bidding OR click on http://www.mdt.mt.gov/business/contracting/.

The following Subsections have been revised since September 11, 2014. Current revisions are noted by an before the date on this index.

SUPPLEMENTAL SPECIFICATIONS TO MONTANA
STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
2014 EDITION

Effective 12/12/19

SUPPLEMENTAL SPECIFICATIONS TO MONTANA
STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
2014 EDITION

SUPPLEMENTAL SPECIFICATIONS TO MONTANA
STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
2014 EDITION

SUPPLEMENTAL SPECIFICATIONS TO MONTANA
STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
2014 EDITION

Effective 12/12/19

SUPPLEMENTAL SPECIFICATIONS TO MONTANA
STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
2014 EDITION

SUPPLEMENTAL SPECIFICATIONS

The following are supplementary or amendatory to the 2014 Edition of the Standard Specifications for Road and Bridge Construction insofar as they apply to this contract.

101.02-ACRONYMS AND ABBREVIATIONS Page 2 2-26-15

Rescind and replace the following Acronym:

D/A .....Dust to actual asphalt ratio

Add the following Acronym:

DP .....Dust to effective asphalt ratio

Rescind the following Acronym:

CAS.....Construction Administration Services

101.03 DEFINITIONS (CALENDAR DAY) Page 6 11-16-17

Rescind and replace the following definition:

CALENDAR DAY
Every day shown on the calendar, beginning and ending at midnight.

101.03 DEFINITIONS (COMPLETION DATE) Page 6 11-16-17

Rescind and replace the definition COMPLETION DATE the following:

FIXED COMPLETION DATE
For Completion Date Contracts, the fixed calendar date that all work on the project is to be complete.

101.03 DEFINITIONS (CONRACT) Page 6 *11-14-19

Rescind the first paragraph and replace the following definition:

The written agreement between the Department and the Contractor detailing the obligations of the parties for the performance of the prescribed work.

101.03 DEFINITIONS (CONTRACTOR OR PRIME CONTRACTOR) Page 7 *11-14-19

Rescind and replace the following definition:

CONTRACTOR OR PRIME CONTRACTOR
The individual or legal entity contracting with the Commission to perform the prescribed work. When used in the specifications, Prime Contractor has the same meaning as Contractor.

101.03 DEFINITIONS (HOLIDAYS) Page 8 11-16-17

Rescind and replace the following definition:

HOLIDAYS
Legal Holidays as defined in Montana Code Annotated Section 1-1-216.

101.03 DEFINITIONS (MAJOR ITEM) Page 8 4-25-19

Rescind and replace the following definition:

MAJOR ITEM
Individual bid items having a bid value equal to or exceeding 10% of the total Contractor's bid.

101.03 DEFINITIONS (NIGHT OR NIGHTTIME) Page 8 4-25-19

Add the following definition:

NIGHT OR NIGHTTIME
Defined as the period of time beginning at sunset and ending at sunrise. Night work is that which occurs during this time. The FWP sunrise/sunset tables, available on the FWP website, are used for specific sunrise/sunset times.

101.03 DEFINITIONS (NO WORK DAYS) Page 9 11-16-17

Rescind and replace the following definition:

Days that work is prohibited under the contract.

101.03 DEFINITIONS (WINTER SHUTDOWN) Page 12 11-16-17

Rescind and replace the definition WINTER SHUTDOWN the following:

WINTER PERIOD
All days from November 16th through April 15th, inclusive.

101.03 DEFINITIONS (WORKING DAY) Page 13 11-16-17

Rescind and replace the following definition:

WORKING DAY
Any day that is charged against contract time in a Working Day contract.

102.03 JOINT VENTURE BIDS Page 15 *11-14-19

Rescind the second sentence of the first paragraph (that begins, "Designate the joint venture..) and replace with the following:

Designate the joint venture business name and specifically authorize a person to execute all bid packages and contracts with the Department on behalf of all individuals and legal entities of the joint venture.

102.03 CONTRACTOR REGISTRATION Page 15 12-11-14

Rescind the first paragraph (that begins, "Montana law…") and replace with the following:

Montana law requires all contractors, except those exempted by MCA 39-9-211, to register with the Montana Department of Labor & Industry.

102.07(B) BIDDING REQUIREMENTS Page 17 9-20-18

Within the second paragraph, rescind the second sentence (that begins, "Written changes to…") and replace with the following:

Written changes to the Schedule of Items, or a bidder's non-submission of every page from the AASHTOWare Project Bids™ EBS file, (including all Schedule of Items pages and all DBE pages), automatically renders the bid non-responsive, and the bid will not be considered.

Within the third paragraph, rescind the third sentence (that begins, "Return a computer…") and replace with the following:

Return an electronic storage device containing the complete project files for all projects bid with the bid package.

102.08 REJECTION OF BID PROPOSALS Page 18 1-18-18

Rescind Part (J) and replace with the following:

J. The bidder does not submit all pages from the AASHTOWare Project Bids™ EBS file.

102.10(B) INTERNET BID SUBMISSION VIA THE INTERNET AND BID EXPRESS™ Page 19 9-20-18

Rescind the first paragraph (that begins, “Bid Proposals are …”) and replace with the following:

Bid Proposals are opened publicly at the place, time, and date specified in the “Invitation for Bids.”

Within Part (2), rescind the second sentence (that begins, “Before running the…”) and replace with the following:

Before running the electronic bidding programs, read the on-line help documentation for the AASHTOWare Project Bids™ software.

Within Part (4), rescind the first sentence (that begins, “Select tools and…”) and replace with the following:

Select tools and then check bid from the Windows AASHTOWare Project Bids™ menu to check the bid and ensure there are no errors prior to submitting the electronic bid.

Within Part (5), rescind the second sentence (that begins, “The Department reserves…”) and replace with the following:

The Department reserves the right to postpone or cancel the public opening of bids in the event of internet, Bid Express™ or Department technical difficulties.

102.11 WITHDRAWAL OF PROPOSALS Page 20 *11-14-19

Within the first paragraph, rescind the second sentence (that begins, “A bidder may…”) and replace with the following:

A bidder may withdraw any Proposal in person or through an authorized agent before any bid Proposal on that project is opened.

Rescind the second paragraph (that begins, “If a bidder...”) and replace with the following:

If a bidder discovers a material (factual, not judgmental) mistake in its bid after the bids have been opened, the bidder understands and agrees that it may either perform the contract as originally bid or request permission from the Department to withdraw its bid.

Rescind the last paragraph (that begins, “The Department will...”) and replace with the following:

The Department will review the request to determine if a mistake occurred, was material and factual, and whether the bid should be allowed to be withdrawn. If the Department does not concur in the error or determines that the error has not been sufficiently proven, it may recommend awarding the contract. If the bidder refuses to execute the awarded contract as it was bid, the bid bond will be forfeited as stated under Section 18-1-204 MCA.

103.02 AWARD OF CONRACT Page 23 *11-14-19

Within the first paragraph, rescind the first sentence (that begins, “The contract will…”) and replace with the following:

The contract will be awarded by the Commission within 45 calendar days after the bid opening to the lowest responsive, responsible, and qualified bidder whose bid proposal complies with all the requirements.

103.06 CONTRACT BOND Page 23 *11-14-19

Rescind the second and third paragraphs (that begins, “The contract bond…) and replace with the following:

The contract bond will remain in effect until the certificate of completion is accepted by the Commission, plus any time period specified by Montana law.

The statutory time for filing claims against the contract bond is 90 calendar days from the date of the Commission acceptance. See Sections 18-2-201 to 18-2-208 MCA.

103.08 FAILURE TO EXECUTE CONTRACT Page 24 *11-14-19

Rescind the last sentence (that begins, “If, due to…) and replace with the following:

If, due to circumstances entirely beyond the control of the bidder, the bidder is unable to file acceptable bonds and insurance policies within the time specified above, the Commission at its sole discretion may waive cancellation of the award and forfeiture of the proposal guaranty.

103.09.2 BID DOCUMENTATION INVENTORY AFFIDAVIT AND ESCROW AGREEMENT Page 24 10-9-14

Within the third (last) paragraph, rescind the web link (that begins, “http://www.…”) and replace with the following:

http://www.mdt.mt.gov/publications/forms.shtml#con

103.09.5 RELEASE OF BID DOCUMENTS TO THE DEPARTMENT Page 25 8-6-15

Rescind the second (last) paragraph (that begins, “Upon the Department’s.…”) and replace with the following:

Within three calendar days of the Escrow Agent’s notification that the Bid Documents will be released to the Department, the Contractor may request to the Department that the Contractor have a representative present during the opening of the bid documents.

103.10 SUBCONTRACTOR REPORT Page 25 7-11-19

Add the following Subsection:

103.10 SUBCONTRACTOR REPORT

No later than 6 calendar days after the date of bid-opening (the date of bid opening to count as the first full day), the apparent low bidder must submit to Construction Contracting Bureau, during its regular work hours, a fully completed Form MDT-CON-102-8 documenting all responding subcontractors, and the work quoted. Include the quoted amount for each subcontractor to be used. If no work is subcontracted, submit Form MDT-CON-102-8 and stipulate “none” within the “subcontractor name” field. If the 6th day is a holiday, turn the documentation in earlier. The DBE commitment information in Expedite must still be reported. The information provided on this form will only be used for reporting at the time of letting.

Form MDT-CON-102-8 is available at the following web page: https://www.mdt.mt.gov/publications/forms/const_forms.shtml.

The bid proposal may be considered non-responsive and rejected if the above form(s) are not submitted within the required time frame.

104.02.3 SIGNIFICANT CHANGES IN THE CHARACTER OF WORK Page 27 4-25-19

Rescind Subsection 104.02.3 and replace with the following:

104.02.3 Significant Changes in the Character of Work

A. Major Item. The Project Manager reserves the right to make, in writing, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alterations do not invalidate the contract nor release the surety, and the Contractor agrees to perform the work as altered.

If the alterations or changes in quantities significantly change the character of the work under the contract, whether such alterations or changes are in themselves significant changes to the character of the work or by affecting other work cause such other work to become significantly different in character, an adjustment, excluding anticipated profit, will be made to the contract. The basis for the adjustment must be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the Contractor in such amount as the Project Manager may determine to be fair and equitable.

If the alterations or changes in quantities do not significantly change the character of the work to be performed under the contract, the altered work will be paid for as provided elsewhere in the contract.

The term “significant change” applies only to the following circumstances:

1. When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction; or,

2. When a major item of work, as defined in Subsection 101.03, is increased in excess of 125% or decreased below 75% of the original contract quantity. Any allowance for an increase in quantity will apply only to that portion in excess of 125% of the original contract item quantity, or in case of a decrease below 75%, to the actual amount of work performed.

B. Minor Item. The Project Manager reserves the right to make, in writing, at any time during the work, changes in quantities and alterations in the work as are necessary to satisfactorily complete the project. These changes in quantities and alterations do not invalidate the contract nor release the surety, and the Contractor agrees to perform the work as altered.

If the alterations or changes in quantities change the character of the work under the contract, whether such alterations or changes are in themselves changes to the character of the work or by affecting other work cause such other work to become different in character, an adjustment, excluding anticipated profit on unperformed work, may be made to the contract. The basis for the adjustment must be agreed upon before the work is performed. If a basis cannot be agreed upon, then an adjustment will be made either for or against the Contractor in such amount as the Project Manager may determine to be fair and equitable.

If the alterations or changes in quantities do not change the character of the work to be performed under the contract, the altered work will be paid for as provided elsewhere in the contract.

A change in character applies when one or more of the following circumstances is met:

1. When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction.
2. When an item of work, not defined as a major item in Subsection 101.03, is increased in excess of 150% or decreased below 50% of the original contract quantity. Any allowance for an increase in quantity will apply only to that portion in excess of 150% of the original contract item quantity, or in case of a decrease below 50%, to the actual amount of work performed.

104.05.2 FAILURE TO PROPERLY MAINTAIN ROADWAY OR STRUCTURE Page 29 7-14-16

Following the first paragraph, add the following to the end of the second bullet (that begins, “Contract time being…”):

A $500 per day road user fee may be charged for each day maintenance is not complete.

104.05.4 MAINTENANCE FOR TRAFFIC DURING WORK SUSPENSIONS Page 30 7-14-16

Within Part B) Winter Suspension, rescind the third paragraph (that begins, “The Contractor may…”) and replace with the following:

The Contractor may request on form MDT-CON-104-05-4B that the Department furnish all resources to perform snowplowing, sanding, and de-icing during winter suspension. If this request is accepted, this work will be detailed in a written agreement. Be responsible for all maintenance, traffic control, and other work not detailed in the agreement. Reimburse the Department, under an accounts receivable, for all Department plowing, sanding, and de-icing expenses according to the terms of the signed agreement.

104.06.1 RIGHTS IN AND USE OF MATERIALS FOUND ON THE PROJECT Page 30 9-20-18

Rescind Subsection 104.06.1 and replace with the following:

Submit a request for and obtain written approval from the Project Manager prior to using excavation for other contract items. If an agreement is reached, the Department will pay the as bid unit price for excavation or the as bid unit price for materials produced, whichever is greater. Include in the request the soil classification of replacement material and any other relevant details. If the excavated material is used, other than as intended, but was needed for embankments, backfills, approaches, or other purposes, provide an acceptable replacement material at no additional cost to the department.

Do not excavate or take material outside the slope stake limits without the Project Manager’s written approval. The right to use and process material found within the project limits excludes the use and processing for noncontract work. If the Contractor produces or processes more material from the project than is required for the contract, without additional compensation to the contractor, the department may:

1. Take possession of the excess material and direct its use; or,
2. Require removal of the material and restoration of the land to a satisfactory condition.

105.02 CONTRACTOR FURNISHED DRAWINGS AND SUBMITTALS Page 35 *11-14-19

Rescind the seventh paragraph and replace with the following:

Working drawings and falsework plans for facilities open to or above public travel ways, including waterways and adjacent banks open for public use, are to be signed by a professional engineer registered in the State of Montana before submittal to the Project Manager.

105.03.3 QUALITY INCENTIVE ALLOWANCE Page 36 8-6-15

Rescind the first paragraph (that begins, “Quality incentive allowances…”) and second paragraphs (that begins, “All quality incentive…”) and replace with the following:

The net incentive or disincentive amount will applied as a line item adjustment on the pay estimate following completion of the item of work.

105.03.3(C) RIDE SPECIFICATION (QUALITY INCENTIVE ALLOWANCE) Page 37 12-11-14

Within Subsection 105.03.3(C), rescind the second paragraph (that begins, “The incentive or disincentive…”) as well as the formulas and variables that follow and replace with the following:

Incentive or disincentive for surface smoothness will be calculated based on the ride category and the entire project length in each travel lane or measured section using the following equation. The calculated value will be applied as a line item adjustment to the plant mix item on the estimate. Calculate the pay adjustment as follows:

Pay adjustment = (Pay Factor -1) x L x Unit Cost
Pay Factor = Calculate using appropriate project category formulas
L = Measured lane length
Unit Cost = Use appropriate value from Table 105-4

Rescind Table 105-4, Unit Cost, and replace with the following:

TABLE 105-4
UNIT COST

Category	Description	Unit Cost/lft.
I or III	Typical section with 0.3 ft. or greater plant mix surfacing	$6.425
I, II, or III	Typical section with 0.2 to 0.29 ft. plant mix surfacing	$4.283
I, II, or III	Typical section with 0.19 ft. or less plant mix surfacing	$3.213

Note: Isolation lifts are not considered part of the surfacing section when determining appropriate overlay depth.

105.05 COOPERATION BY CONTRACTOR Page 40 9-20-18

Rescind the first paragraph of Subsection 105.05 and replace with the following:

The Department will not furnish hard copies of contract documents. Ensure access to all plans and contract documents is available on the project at all times (whether paper or electronic). Electronic contract documents can be found at the following link, under the appropriate “Bid Packages” links: http://www.mdt.mt.gov/business/contracting/.

105.16.1 NOTICE OF CLAIM Page 47 7-14-16

Within the first paragraph, rescind the first sentence (that begins, “Submit a notice…”) and replace with the following:

Submit a notice of claim using the Department’s Notice of Claim Form MDT-CON-105_16_1A no later than the next business day of disagreements that are to be the subject of a claim for additional compensation, time extension, contract change, or other remedy.

105.16.2 SUBMISSION OF CERTIFIED CLAIMS Page 48 7-14-16

Within the first paragraph, rescind the first sentence (that begins, “If an agreeable…”) and replace with the following:

If an agreeable resolution is not reached within 14 calendar days of the written notice, the Contractor may submit a Certified Claim using the Certified Claim Form MDT-CON-105-16-2 to the Project Manager no more than 7 calendar days after receipt of the Project Manager’s response.

105.16.3 DECISION ON CLAIMS Page 48 1-18-18

Rescind the first paragraph (that begins, “The Prime Contractor…”) and replace with the following:

The Prime Contractor must verify the claim data and certify the claim. Claims from a subcontractor or supplier will not be accepted. The DCE will provide a written decision no more than 30 calendar days after receipt of the Certified Claim for contracts that do not require Escrow of Bid Documents. The DCE will provide a written decision no more than 45 calendar days after receipt of Bid Documents for Contracts that require Escrow of Bid Documents. Where a series of claims are filed on contracts that require Escrow of Bid Documents, each claim will have a written decision from the DCE no more than 45 calendar days after the date of receipt of the individual claim. If additional time is required to research and evaluate the Claim, the DCE can extend the time period 14 calendar days by notifying the Contractor in writing.

105.17.1 FINAL WALK-THROUGH PROCESS Page 49 2-26-15

Within part 6, replace the form with the following:
MDT-CON-105_17_1D

Rescind and replace part 7 with the following:

7. The Project Manager will grant Conditional Final Acceptance within 30 calendar days of the receipt of the request for the final walk-through verification. If the punch-list items are fully resolved, no further action is required. If deficiencies still exist, payment will be deducted from the estimate as appropriate. The final acceptance will be granted when all contract-specific warranties have expired and all warranty issues have been resolved.

105.17.2 FINAL ACCEPTANCE Page 50 1-18-18

Within the first paragraph, rescind the first sentence (that begins, “When the Final Walk-through…”) and replace with the following:

When the Final Walk-through Process is complete (conditional final acceptance), all project-specific warranties have expired, and all warranty issues have been resolved, submit the Contractor’s Certificate of Work Complete using form MDT-CON-105_17_2.

Rescind bullets 4 (that begins, “There are no pending…) and 5 (that begins, “There are no known…).

Add the following bullet (9) following bullet (8)

9. All construction claims made on the contract have been submitted, and are closed or resolved as of this date.

105.17.3 FINAL ESTIMATE PROCESS Page 51 4-25-19

Rescind the second and third paragraphs and replace with the following:

When the final estimate is prepared and all required documentation (such as material certifications, labor dispute resolutions, etc.) has been received, the CES Bureau will send a copy of the final estimate to the Contractor for review. The Contractor has 10 calendar days to notify the Project Manager in writing if the final estimate is acceptable. If no response is received within that timeframe, concurrence will be assumed.

To dispute the final estimate, submit the items disputed and justification to the CES Bureau. Provide a copy to the Project Manager. The CES Bureau will provide a written decision on the disputed items.

106.02.3 CONTRACTOR FURNISHED SOURCES Page 55 4-25-19

Within Part (A), replace MT 214 with AASHTO M 145.

Within Part (B), replace MT 209 with AASHTO T 96.

106.02.5(A) GENERAL Page 56 10-9-14

Within the first paragraph, rescind the second sentence (that begins, “Comply with the …”) and replace with the following:

Comply with the pertinent statutes relating to open cut mining (Section 82-4 MCA); hard rock mining (Section 82-4-3 MCA); water quality (Section 75-5 MCA); stream bank preservation (Section 75-5 MCA); the Montana County Noxious Weed Management Act Section 7-22-21 MCA; and all other applicable federal, state, and local statutes, regulations and ordinances.

106.05 FIELD LABORATORY Page 57 8-6-15

Rescind Subsection 106.05 and replace with the following:

106.05 FIELD LABORATORY

The Department will furnish all field offices, laboratories and cure boxes.

Furnish and install electrical power as directed:

- A continuous 200-ampere, 220 to 230 volt, single phase, 60-hertz power supply using a four wire connector; or
- A 110 to 120 volt alternating current of sufficient capacity.

Have the source connected by a Montana licensed electrician.

Furnish a potable water supply to operate all testing equipment for the offices and laboratories.

Notify the Project Manager at least 2 business days prior to producing material to be tested in the field laboratory or cured in the cure boxes. Do not begin production until the test trailer or cure box is fully operational.

No additional payment will be made for providing power and water to the field offices, laboratories or cure boxes. Include these costs in the other items on the project.

106.09 DOMESTIC MATERIALS Page 58 *11-14-19

Rescind Subsection 106.09 and replace with the following:

Furnish domestic steel or iron materials for permanent incorporation in the work. Domestic material is material produced by manufacturing processes, including coating of steel or iron, that have occurred entirely in the United States. Pig iron, and processed, pelletized and reduced iron ore may be manufactured outside the United States. In accordance with MT 601, furnish the appropriate manufacturer's documentation of the manufacturing processes, including coatings of covered materials, as performed in the United States. Submit a completed Form 406 for all Category 1 or Category 2 items.

Do not incorporate steel or iron materials into the project until all required documentation is submitted to the Department. Ensure that suppliers understand the contract requirements to supply the required documentation. Domestic steel and iron must meet the requirements of 23 CFR 635.410 and 23 USC Section 313. Submit documentation to the Department in a clear, organized, legible manner or it will be returned. Clarify which material certifications are for which items. The Department will review the submitted documentation one time at no cost to the contractor. If the Department determines that the submitted documentation is inadequate or fails to meet the contract requirements, the submitted documentation will be returned for clarification or correction. The cost for the Department’s re-review of the same submittal is the contractor’s responsibility, and may be deducted from contractor payments.

The Department will not accept items installed until all supporting documentation has been reviewed and is found to be in accordance with the contract requirements. Insufficient or unavailable documentation or documentation showing products to contain steel of foreign origin are grounds for removal and replacement at the contractor’s expense.

Material inspection of pre-cast products, prefabricated steel products, or prefabrication plants will take place at the point of manufacture. The District Materials Lab, Helena Materials Bureau, or Department representative will inspect the manufacturing of these items and verify that the fabricator is maintaining supporting documentation. All precast products containing steel and prefabricated steel products delivered to the project must be accompanied by signed documentation from the end product manufacturer (precast plant or prefabrication plant) which states that all steel used in the product has been melted/recycled and manufactured entirely in the United States and they have maintained supporting documentation. Original mill test reports from steel fabricators or suppliers are not required to be submitted to the Project Manager for precast and prefabricated steel products. Submit a Form 406 with signed documentation by the end product manufacturer or prefabrication plant that all steel incorporated has been melted/recycled and manufactured entirely in the United States. All supporting documentation (original mill test reports) must be maintained by the fabricator and made available to the Department as requested.

A minimal quantity of foreign manufactured steel and iron material may be used if the cost of the material, including delivery costs to the project, does not exceed one-tenth of 1% of the total contract amount or $2,500.00, whichever is greater. Submit a request to use a minimal quantity of foreign manufactured steel and iron a minimum of 5 business days before incorporation into the work. Include in the request the dollar amount of the steel for this request, and the cumulative dollar amount requested to date. Provide documentation, typically in the form of invoices, showing product and delivery cost. Failure to do so will require removal and replacement of all foreign steel and iron with domestic steel and iron. If the foreign steel and iron cannot be positively distinguished from any domestic material used, then all of the material must be removed and replaced with domestic steel and iron at the contractor’s expense.

107.11.5 NOXIOUS WEED MANAGEMENT Page 67 10-9-14

Within the fourth paragraph, rescind the web link (that begins, “www.agr…”) and replace with the following:

http://agr.mt.gov/agr/Programs/Weeds/

107.11.8 PROTECTION OF AQUATIC RESOURCES Page 69 7-14-16

Add the following to the end of the first paragraph (that begins, “Unless permitted or…”):

When working above aquatic resources, employ positive means to protect aquatic resources below.

Rescind the second paragraph (that begins, “In areas adjacent…”) and replace with the following:

In areas adjacent to any water body including streams or irrigation ditches crossing the highway, and any wetland areas; or in areas immediately adjacent to the highway susceptible to sediment transport, conduct construction, staging and paving operations in a manner to prevent materials from entering these areas.

107.13.1 INSURANCE ON ALL CONTRACTS Page 69 4-25-19

Within Part (C), within the paragraph that begins, “Maintain commercial general…”, rescind the first sentence (that begins, “Maintain commercial general…”) and replace with the following:

Maintain commercial general liability insurance in full force from the effective date stipulated in the Notice to Proceed until Commission acceptance of the project, unless written approval is given by the CES Engineer to cancel the policy.

Within the last paragraph, rescind the second sentence (that begins, “Do not begin…”) and replace with the following:

Do not begin work until the policies are reinstated and submitted to the CES Bureau in Helena.

107.13.2 INSURANCE INVOLVING RAILROADS Page 70 4-25-19

Within the fourth (last) paragraph rescind the second sentence (that begins, “Do not begin…”) and replace with the following:

Do not begin work until the policy is reinstated and submitted to the CES Bureau in Helena.

107.18 CONTRACTOR’S RESPONSIBILITY FOR UTILITY PROPERTY AND SERVICES Page 74 *11-14-19

Rescind the last paragraph (that begins, “The Commission may…”) and replace with the following:

The Department may require the Contractor to furnish protective public liability and property damage insurance to each corporation, company, partnership, or individual owning or operating the properties affected.

107.27 DIESEL FUEL USED ON THE PROJECT Page 75 5-25-17

Add the following paragraph after the second (last) paragraph:

Motor Carrier Services officers visiting a project site may obtain fuel samples from bulk tanks and supply tanks of vehicles, equipment, and other internal combustion engines at any time. The sample(s) may be analyzed for dye concentration by a laboratory selected by the Department.

108.01.1 SUBCONTRACTING Page 77 4-25-19

Within the second paragraph rescind the third sentence (that begins, “When required…”) and replace with the following:

When required, a final determination will be made by the CES Engineer.

Rescind the note marked with a * beneath Table 108-1 and replace with the following:

*Contact the Department’s Labor Compliance office for a determination.

Add the following sentence to the third paragraph (that begins, “The same criteria…”:

Ensure all subcontracts are submitted through the Prime Contractor.

108.01.2 CONTRACT PERFORMANCE Page 77 4-25-19

Add the following paragraph after the first paragraph:

“Specialty Items” are defined as 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.

Within the second paragraph, rescind the second sentence (that begins, “When a portion…”) and replace with the following:

When a portion of an item is subcontracted, the percentage of the work subcontracted will be based on either the subcontract item unit price or on an estimated percentage of the contract item unit price, determined by the CES Engineer.

Within the third paragraph, rescind the first sentence (that begins, “Do not allow…”) and replace with the following:

Do not allow a Subcontractor at any contract tier to start work until its subcontract is consented to by the CES Engineer.

108.01.3 SUBCONTRACTOR PAYMENTS Page 78 7-11-19

Rescind Subsection 108.01.3 and replace with the following:

108.01.3 Subcontractor Payments

Submit payment information for all subcontractors and suppliers to the Department within the timeframes shown. Identify any payments that have been withheld from subcontractors or suppliers.

- Prime contractors with first tier subcontractors or suppliers within 7 calendar days of payment from MDT.
- First tier subcontractors with second tier subcontractors or suppliers within 7 calendar days of payment from prime contractor.

Submit payment information at the following link: https://app.mdt.mt.gov/spr//.

108.03 PROSECUTION OF WORK Page 78 12-8-16

Rescind Subsection 108.03 and replace with the following:

108.03 PROSECUTION OF WORK

108.03.1 General

Begin obtaining all air quality, water quality and storm water runoff permits, approval of reclamation plans, and archaeological and historical clearances immediately upon receipt of the notice of contract award letter from the Department. Furnish the completed applications to secure permits, approvals or clearances as they are submitted to the respective agency. Furnish approved permits, reclamation plans and clearances necessary to complete the work in conformance with all federal, state and contract requirements.

The Department will reimburse all reasonable costs incurred in securing the permits, approvals and clearances if the Department does not execute the contract for reasons outside its control.

A pre-construction conference will be held on a mutually agreed date between the Contractor, Department and other parties interested in the work before work within the project limits begins no later than 20 calendar days after the Notice to Proceed date. The Contractor’s superintendent in charge of the project must attend the conference. Encourage subcontractors to attend. No payments will be made on the contract until the pre-construction conference has been held.

Obtain written approval before starting night work. Provide work area flood lighting for night work and do not rely solely on equipment lights. Night work approval may be rescinded at any time.

Suspending and resuming work on all or a part of the contract will be by Subsection 105.01.

Work may be suspended on working day contracts for unsuitable weather or for other conditions that are detrimental to the work accuracy and quality. Prevent damage and repair damaged work that was not protected during the suspension at Contractor expense. No time extensions will be approved for work to correct non-protected work.

Store materials to protect against damage and without obstructing, endangering or impeding traffic.

Do not allow water to pond on the roadway or within the construction limits, excluding environmental protective devices. Open ditches and shoulder drains, and take other actions to protect the public and the work.

The Department does not authorize project suspension by the Contractor and time will be charged during unauthorized project suspensions. If the Contractor suspends the project, provide written notification of the suspension to the Project Manager 7 calendar days before the suspension. The Contractor is responsible for all maintenance required during unauthorized suspensions and for all work and materials required due to the suspension.

108.03.2 Project Schedules

Furnish a WN that details the work and time (working days, calendar days or completion date) to complete the contract. The initial schedule must show that the work will be completed in the time frame specified in the contract.

A. ASC Schedules. For projects not subject to Subsection 108.03.2(B) requirements, submit a schedule in accordance with the Table of Contractor Submittals. No other work, except obtaining permits, may begin until the schedule requirements have been met. No payments will be made on the contract until the submitted schedule is reviewed.

The Contractor may use a CPM schedule as the ASC if it meets the requirements described in Subsection 108.03.2(A) herein and results in no additional cost to the Department.

1. Include in the ASC:
   a. A bar chart chronologically sequenced and to time scale showing the following:
      1) All work activities with a completion duration of 5 or more working days. (For this requirement, working days does not exclude the period from November 16th through April 15th.)
      2) Any work activity that has an impact on completion of the project.
   b. The relationship of each work activity listed in Subsection 108.03.2(A)(1)(a) to other work activities, permits, plans, submittals and approvals required to complete the project.
   c. Work activity durations by working days or calendar days as appropriate. Indicate non-working periods exceeding 3 days on each activity bar.
2. Include in the WN:
   a. The proposed work process sequence describing the relationship of the work activities listed in Subsection 108.03.2(A)(1) required to complete the contract, including shop drawing submittals, permits (including estimated maximum waiting periods for all required permits), fabrication and delivery activities.
   b. A detailed description and the progress time of each work activity listed in Subsection 108.03.2(A)(1) measured by working day or calendar day, as appropriate.
   c. A detailed description of the ASC, including holidays, planned workdays per week, number of shifts per day, hours per shift, size of work crews and resources used.
   d. Adjustments to activity durations and production rates to account for weather.

Submit an updated ASC and WN every month in which work is performed, one week before the end of the project's monthly estimate cycle. The ASC and WN must show current progress and all revisions or modifications that reflect changes in the method or manner of the work, specification changes, extra work, changes in duration, changes in shifts, work crews or resources.

The Project Manager's review and acceptance does not attest to the validity of the ASC or WN.

B. CPM Scheduling. Develop, maintain and provide a detailed time-scaled computer generated progress schedule using the critical path method that is compatible with Primavera P6 or other Primavera product which generates a .xer file type.

Submit a schedule in accordance with the Table of Contractor Submittals. No other work, except obtaining permits, may begin until the schedule requirements have been met. No payments will be made on the contract until the submitted schedule is reviewed.

Schedule all contract work including that of subcontractors, vendors and suppliers. The initial schedule must show that the work will be completed in the time frame specified in the contract.

The Project Manager's review and acceptance of the CPM schedule does not attest to the validity of the Contractor's assumptions, logic constraints, dependency relationships, resource allocations, labor and equipment or other schedule aspects.

1. Preparation and Submission of Schedule. Prepare an initial schedule and submit an electronic file compatible with Primavera P6 or other Primavera product which generates a .xer file type. Once an accepted baseline schedule is submitted, furnish one ANSI D (24-inch by 36-inch) paper copy. Submit all items listed in Subsection 108.03.2(B)(3).

   Attend a meeting scheduled by the Project Manager within 10 calendar days of the Project Manager's receipt of the CPM schedule to review, correct or adjust the CPM schedule if required.

   Make all schedule adjustments and corrections discussed at the meeting and re-submit the revised schedule within 15 calendar days after the meeting. Plan and execute the work to meet project milestones and completion dates.
2. Initial Schedule Requirements. Include the requirements listed in Subsection 108.03.2(B)(3) and the following:
   a. Early start sort;
   b. 60-day look ahead bar charts by early start; and
   c. Logic diagram having a maximum 100 activities for each ANSI D (24-inch by 36-inch) size sheet. Ensure each sheet includes project number, page number, title, match data or diagram correlation and key to identify all components used in the diagram.
3. Schedule Requirements. Submit schedules that include:
   a. Activity identification numbers;
   b. Project milestones;
   c. Activity descriptions;
   d. Appropriate relationships;
   e. Activity durations of no more than 30 days:
   f. Procurement of permits;

g. Material procurement separated into at least two activities, fabrication and delivery. Include time for delivering all submittals and Department review of working drawing submittals as separate items in the schedule logic for all items requiring submittal, review and approval;
h. Activities coded to reflect the party performing each activity (only one party performs each activity) including subcontractors and suppliers and the area/location of each activity;
j. Phasing (staging) details, if the work has phasing or is to be performed in phases;
k. A WN which describes the following:
- Anticipated work in an orderly sequence of the construction phasing;
- Work days per week, holidays, number of shifts per day, and hours per shift;
- Activity relationships;
- Anticipated problems;
- Anticipated project completion dates, in a detailed description; and
- Activity manpower, equipment, unit quantities and production rates.

WNs that are a listing of the work will not be accepted. Include a WN with each submission;
l. Calendars, including no work days as defined in Subsection 101.03, or other Contractor non-work periods. Use only project specific calendars. All activities must be identified by entry of their appropriate calendar; and
m. Adjustments to activity durations and production rates to account for weather.

Use only contractual constraints in the schedule logic.

Float is defined as the amount of time between when an activity “can start” and when it “must start”. Total float is float shared with all other activities and is defined as the amount of time an activity can be delayed without affecting the overall time of project completion. Float is a shared commodity, not for the exclusive use or financial benefit of either party. Either party has the full use of float until it is depleted.

The critical path is defined as the longest continuous sequence of activities through the network schedule that establishes the minimum overall project duration. The submitted activity sequence and durations must generate a CPM schedule having a critical path with zero total float. Keep multiple critical paths and near-critical paths to a minimum. Describe multiple critical paths and near-critical paths with thorough and reasonable justification in the written narrative.

Show the sequence and interdependence of all activities required for the complete performance of all items of work under this contract, including acquiring all the environmental permits. Show all network “dummies” on the diagram.

The Department reserves the right to limit the number of activities on the schedule to between 50 and 1000 activities.

Describe the activities so that the work is identifiable and the progress on each activity is measurable.

4. Schedule Updates. Schedule and attend monthly project progress meetings to compare the schedule to the actual finish dates of completed activities, the remaining duration of uncompleted activities and the proposed logic and/or time estimate revisions. Provide the status of activities at these meetings, and the schedule updates based on this information, once it has been verified.

Each month of the project, one week before the end of the project’s monthly estimate cycle, submit an electronic file using Primavera P6 or other Primavera product which generates a .xer file type and a .PDF file containing:

a. Total float sort;
b. The data date and current date line on the bar chart.
c. A WN describing the critical path, logic revisions or modifications to the schedule, including, but not limited to: changes in the method or manner of the work, changes in specifications, extra work, changes in duration, etc.; and
d. Any revised activity on node diagrams for the following:
1) Delay in the completion of any critical activity;
2) Actual prosecution of the work that is different than that represented on the CPM schedule; and
3) The addition, deletion, or revision of activities required by contract modification or logic revisions.

Ensure monthly schedule updates reflect the previous month’s actual work. Correct errors listed by the Project Manager within 3 business days of notification. The contract time will be adjusted only as specified in the contract. Furnish documentation to support requests for time extensions for milestone dates or the contract completion date.

C. Submittal Requirements. Ensure that the WN and project schedules submitted meet the above requirements and accurately reflect the work progress. If the work is not proceeding consistently with the Contractor’s most recently reviewed schedule or WN, the Project Manager may suspend work under Subsection 105.01(A) if the WN or project schedule does not accurately reflect the actual progress of the work; the suspension may continue until an accurate WN and project schedule is submitted.

Any delay in beginning or prosecuting work that is caused by the Contractor’s failure to provide an ASC or WN when, and as required, is the responsibility of the Contractor, and is not an excusable delay.

Prosecute the work with the resources required to complete the contract within the time shown in the Contractor’s updated schedule and WN.

Failure to submit an initial CPM or ASC schedule or schedule update to the Project Manager within 2 calendar days of its due date will result in a monthly deduction in accordance with Table 108.1A.

TABLE 108-1A

PROJECT SCHEDULE DEDUCTIONS

Original Contract Amount		Monthly Deduction
From More Than	To and Including	
$ 0	$ 1,000,000	$ 300
$ 1,000,000	$ 3,000,000	$ 700
$ 3,000,000	—	$ 1,000

C. Method of Measurement

CPM schedule is measured by the lump sum. Other scheduling requirements are not measured for payment.

D. Basis of Payment

Payment for all costs associated with CPM scheduling is included in the lump sum contract unit price for CPM scheduling. Payment for all costs associated with other scheduling requirements is included in the payment for other items of work.

The Project Manager may withhold 10% of each monthly progress estimate for failure to submit an initial, updated, or revised WN and CPM or ASC schedule on time and in the manner required. Payment withheld for violation of the schedule requirements will be included in the next progress estimate following the Contractor's submission of the required schedule.

Partial payments for CPM scheduling will be made based on the lump sum contract unit price as follows:

1. 50% when the initial schedule is finalized.
2. 75% when the overall project is 50% complete.
3. 100% when all updates have been submitted.

108.07 DETERMINATION OF COMPENSATION AND EXTENSION OF CONTRACT TIME FOR EXCUSABLE, NON-COMPENSABLE, AND COMPENSABLE DELAYS — Page 83 — 12-13-18

Rescind Subsection 108.07 and replace with the following:

108.07 CONTRACT TIME AND DETERMINATION OF COMPENSATION AND EXTENSION OF CONTRACT TIME FOR EXCUSABLE, NON-COMPENSABLE, AND COMPENSABLE DELAYS

The contract provisions state the contract completion date or the allowable number of Calendar or Working Days allotted for completion of the contract work.

Do not resume work during an authorized suspension of work without approval from the Project Manager.

Do not work on Sundays and Holidays without written approval from the Engineer. Travelway maintenance in accordance with Subsection 104.05.2, stormwater BMP maintenance, and providing protection for the public are exempt work items and may be performed on No-Work Days without assessment of contract time.

108.07.1 COMPLETION DATE CONTRACTS — Page 83 — 11-16-17

Rescind Subsection 108.07.1 and replace with the following:

Begin work on the effective date stated in the Notice to Proceed. Complete all work by the completion date specified in the contract.

The completion date will be extended for the following:

A. Extensions of contract time added in accordance with Subsection 108.07.5; or
B. Suspensions of work authorized after the contract is awarded (other than the winter period); or
C. Delays in the award of the contract.

The new completion date is determined by adding the Calendar Days granted under Subsection 108.07.5; the number of Calendar Days during authorized suspensions (other than the winter period); or the number of Calendar Days the Award was delayed past the posted award date to the specified completion date, with equitable time adjustment for No-Work Days.

The actual completion date is the date the Project Manager approves the Contractor's Certificate of Work Complete form in accordance with Subsection 105.17.2.

Contract time overruns for assessment of liquidated damages will be computed as the number of Calendar Days elapsing between the contract Completion Date and the actual completion date.

108.07.2 CALENDAR DAY CONTRACTS — Page 84 — 11-16-17

Rescind Subsection 108.07.2 and replace with the following:

Begin work on the effective date stated in the Notice to Proceed. Complete all work within the number of Calendar Days specified in the contract.

Except during authorized suspensions, every day on the calendar is assessed against contract time, including No Work Days.

Contract time assessment will cease when the Project Manager approves the Contractor's Certificate of Work Complete form under Subsection 105.17.2.

Contract time overruns for assessment of liquidated damages will be computed as the number of Calendar Days the contract is not complete beyond the contract time specified.

108.07.3 WORKING DAY CONTRACTS Page 84 4-25-19

Rescind Subsection 108.07.3 and replace with the following:

Begin work on the effective date stated in the Notice to Proceed. Complete all work within the number of Working Days specified in the contract provisions.

Meet the requirements in Table 108-3:

TABLE 108-3
HOLIDAY CONTRACT TIME ASSESSMENT

Holiday:	Stop Work by:	Return to Work:
Memorial Day	3:00pm on the Preceding Friday[1]	Tuesday
Labor Day	3:00pm on the Preceding Friday[1]	Tuesday
When July 4 Occurs On:	Stop Work by:	Return to Work[2]:
Monday	3:00pm on the Preceding Friday[1]	Tuesday
Tuesday	The end of day on the Preceding Friday	Wednesday
Wednesday	3:00pm on the Preceding Tuesday[1]	Thursday
Thursday	3:00pm on the Preceding Wednesday[1]	Monday
Friday	3:00pm on the Preceding Thursday[1]	Monday
Saturday	3:00pm on the Preceding Thursday[1]	Monday
Sunday	3:00pm on the Preceding Friday[1]	Tuesday

Note 1: If all work operations are stopped before 12:00pm (noon), contract time will not be assessed on this day.
Note 2: Contract time will not be assessed between the stop work by and return to work days.

Contract time assessment will cease when the Project Manager approves the Contractor's Certificate of Work Complete form in accordance with Subsection 105.17.2.

All days except No-Work days are assessed against the contract time, except as follows: contract time will not be assessed on:

- Winter Period days that the Contractor does not work;
- Winter Period days when the work has no impact to the traveling public; or,
- On any Saturdays that the Contractor does not work.

Traffic flowing unimpeded on approved detours is considered to have no impact on the traveling public. Contract time will not be assessed for days having inclement weather or the aftermath of inclement weather that prevent the Contractor from working at least six hours in the day. Inclement weather will not be considered when assessing time if the contractor is not actively performing work or is not scheduled to work. Suspension of work is authorized for the Winter Period.

Chargeable and non-chargeable working days will be determined daily by the Project Manager. For any week that the Contractor has chargeable days, the Project Manager will furnish a weekly report on the following Monday showing the number of working days:

A. Charged for the preceding week;
B. Previously charged;
C. Specified for contract completion;
D. Approved time extensions; and
E. Remaining to complete the contract.

Submit a written protest to the Project Manager within the timeframe shown on the weekly report for any alleged discrepancies in the time assessed. Failure to file a protest is conclusive evidence that the time assessed is accepted as correct.

Contract time overruns for assessment of liquidated damages will be computed as the number of working days assessed beyond the contract time specified.

108.07.5 EXTENSIONS Page 85 8-6-15

Rescind the third paragraph (that begins, "The contract time…") and replace with the following:

The contract time as awarded is based on the estimated quantities as defined in Subsection 102.05. No decrease in contract time will be made for an underrun in a contract item quantity. The contract time will be modified based on the quantity and difficulty of added or deleted work and how it impacts the critical activities of the Contractor's operation as shown on the most current work schedule as required under Subsection 108.03 or as justified to the Project Manager.

108.08 FAILURE TO COMPLETE ON TIME Page 86 4-25-19

Rescind Table 108-2 and replace with the following:

TABLE 108-1
SCHEDULE OF LIQUIDATED DAMAGES

ORIGINAL CONTRACT AMOUNT		DAILY CHARGE
From More Than	To and Including	Working Day or Calendar Day
$ 0	$ 100,000	$ 1,116
$ 100,000	$ 300,000	$ 1,430
$ 300,000	$ 700,000	$ 1,629
$ 700,000	$ 1,500,000	$ 1,898
$ 1,500,000	$ 3,000,000	$ 2,066
$ 3,000,000	$ 5,000,000	$ 2,501
$ 5,000,000	$ 10,000,000	$ 3,053
$ 10,000,000	—	$ 3,850

Rescind the third paragraph (that begins, “If the Contractor …”) and replace with the following:

If the Contractor disputes the liquidated damages on the approved “Contractor’s Certificate of Work Complete” form, the CES Bureau will send a final notification in writing to the Contractor of the number of days to be assessed and the dollar amount of proposed liquidated damages. Submit any objections of the assessment to the CES Bureau in writing within 30 calendar days of receipt of the Department’s notification. Include with the objection the justification and all information to support an adjustment to the assessment. The Department will review the Contractor’s information and perform a final analysis.

Within the fourth paragraph, rescind the second sentence (that begins, “The CAS Bureau …”) and replace with the following:

The CES Bureau will submit the Contractor’s information and the Department’s recommendation to the Commission.

Rescind the last paragraph (that begins, “The Commission will review …”)

109.04.2(A) LABOR Page 92 9-20-18

Rescind Part A. Labor and replace with the following:

A. Labor. The Contractor is paid the wage rates for all labor and foremen assigned exclusively to performing the extra work for the total hours worked on-site plus 80% of the total. The 80% surcharge may be increased if supporting documentation is submitted by a certified public accountant (CPA) showing that a higher percentage surcharge is needed to cover labor costs. This documentation may be audited to determine compliance of allowable surcharges. The wage rates used for the above computation will not include travel pay (unless included in the USDOL wage decision) or fringe benefits, whether or not paid directly to the employees. Payment as described above is full compensation for all labor related expenses incurred including but not limited to premiums for worker’s compensation insurance, public liability and property damage insurance, social security, unemployment compensation, health and welfare expenses, and other expenses imposed by federal or state laws or both. Submit evidence of the actual wage rates paid. Only labor on certified payrolls is eligible. The rate paid will be that which is listed on the certified payroll.

109.06 PARTIAL PAYMENTS Page 94 4-16-15

Rescind the second paragraph (that begins, “The Department reserves…”) and replace with the following:

The Department reserves the right to withhold all or part of any partial payments earned under the contract until all tax payments due or owed to the State of Montana are paid in full.

109.07 STOCKPILED MATERIALS Page 95 8-6-15

Add the following sentence at the end of the seventh paragraph (that begins, “Partial Payments…):

Submit stockpiled materials requests using the same unit of measure as the contract item.

109.10 OVERPAYMENTS Page 97 8-6-15

Within part 1 rescind the forth sentence (that begins, “The interest rate…”) and replace with the following:

The interest rate charged will be the greater of 10% or the highest rate allowed by the law for the period in which the overpayment is not repaid.

201.03.1 GENERAL Page 99 10-9-14

Rescind the seventh paragraph (that begins, “Stake construction limits …”) and replace with the following:

Stake construction limits for cuts, fills, channel changes, ditches, fence lines, utility relocation, roadside development areas, selective thinning for sight distance, grubbing, and similar areas to establish clearing and grubbing limits in accordance with Subsection 105.08.

203.03.1 EXCAVATION Page 108 10-9-14

Rescind the second paragraph of Subsection (G) Digout, (that begins, “Provide special…”) and replace with the following:

Furnish replacement material for digouts in accordance with Subsection 701.12.

Rescind the first and second paragraphs of Subsection (H) Sub Excavation, (that begins, “In areas of…”) and replace with the following:

Unless otherwise shown in the contract or directed by the Project Manager, in areas of sub excavation, excavate the full road width to a depth of 2 feet (600 mm) below the top of the subgrade soils or to a depth where the subgrade soils are firm and stable, whichever is shallower. Excavate parallel to the finish grade, day lighting to the left and right slopes. Slope the ends of the excavation no steeper than a 10H:1V. Dispose of the excavated material to the satisfaction of the Project Manager.

Furnish sub-ex replacement material in accordance with Subsection 701.12.

203.03.6 TOPSOIL - SALVAGING AND PLACING Page 113 1-18-18

Add the following to the end of the fifth paragraph:

Limit individual stockpile lengths to 500 feet (150 m) maximum. Place a break between stockpiles of at least 40 feet (12 m).

204.03.3 MASTER BLASTING AND SAFETY PLAN Page 118 12-8-16

Rescind the first sentence and replace with the following:

Submit a Master Blasting and Safety Plan on form MDT-CON-204-03-03, along with any comments from the Blasting Consultant, to the Project Manager for review at least 10 business days before the start of test or production drilling operations or at any time the drilling and blasting methods, or explosive type or product are changed.

Within Part A. Blasting Plan, replace the first sentence with:

Blasting Plan. Include the following information, at a minimum, in the blasting portion of the plan:

Within Part B. Safety Plan, rescind and replace the first paragraph with:

Safety Plan. Include the following information, at a minimum, in the Safety portion of the plan:

206.03.2(B) STRUCTURES Page 129 12-11-14

Rescind Subsection 206.03.2(B) and replace with the following:

B. Structures. If a bridge is chosen as means for conveyance of the waterway, provide a minimum waterway opening of sufficient size to accommodate the 2-year flood event, spanning the active channels with 1-foot (305 mm) minimum freeboard. Construct all temporary bents in a manner that the current remains un-deflected. Provide adequate bulkheads at the approach fills to prevent fill materials from entering the waterway.

Provide the detour bridge with a width greater than or equal to that of the existing bridge, with a design live load capacity of HL-93 loading, for LRFD designs, or AASHTO HS-20 (MS-18), for ASD and LFD designs. Provide a rail system with blunt end protection at all bridge ends. Ensure the approach rail system meets either NCHRP 350 or MASH crash test requirements in accordance with Table 206-1. Ensure the bridge rail can resist railing design forces as specified in the AASHTO LRFD (Table A13.2-1) for the detour design speed in accordance with Table 206-1.

TABLE 206-1
DETOUR BRIDGE DESIGN

Design Speed	Bridge Rail	Approach Rail Elements
3	TL-1	TL-1
> 30 mph – 45 mph	TL-1	TL-2
> 45 mph	TL-2	TL-3

208.03.2 WATER POLLUTION CONTROL Page 133 4-16-15

Within part C, rescind the fifth (last) paragraph (that begins, “BMPs will be…”) and replace with the following:

BMPs will be inspected during construction and during the final inspection to ensure they are installed, maintained, and functioning as required by the contract and permits. BMPs will be inspected as part of the final walk-through to ensure they are adequate, maintained, and functioning properly.

Within part D, rescind the sixth (last) sentence (that begins, “Provide a copy…”) and replace with the following:

Provide a copy of the NOI package submitted and confirmation for receipt of a complete NOI package from the permitting agency to the Project Manager prior to conducting any ground disturbance activities.

Rescind the second paragraph of Subsection 208.03.2 (the paragraph following part D) (that begins, “Do not transfer…”) and replace with the following:

Do not transfer or terminate the General Storm Water Permit coverage until the BMPs are inspected and accepted and all records required under the permit, including inspection and monitoring reports, are furnished to the Project Manager. The Department may require that certain BMPs be removed and/or replaced by another type of BMP as a condition of permit transfer.

Within the fifth (last) paragraph of Subsection 208.03.2, rescind the first sentence (that begins, “When submitting the…”) and replace with the following:

When submitting the MPDES General Storm Water Permit transfer package/application to the Department, include a check for the permit transfer fee.

208.03.3 AQUATIC RESOURCE PROTECTION Page 135 4-16-15

Within part A, rescind the part 1 (that begins, “Do not operate…”) and replace with the following:

1. Do not operate mechanized equipment in any regulated aquatic resource, unless authorized in accordance with Subsection 208.03.3(B).

Within part A, rescind the part 2 (that begins, “Isolate work zones…”) and replace with the following:

2. Isolate work zones from flowing and standing waters during construction, unless authorized in accordance with Subsection 208.03.3(B).

Within part A, rescind the part 5 (that begins, “Do not place …”) and replace with the following:

5. Do not place fill or other materials in any regulated aquatic resource unless included in the contract or authorized in accordance with Subsection 208.03.3(B).

Within part B, add the following sentence to the end of the first paragraph:

Submit Temporary Facility and Construction Activity permit applications for COE 404 and SPA 124 Notifications in accordance with Subsection 107.11.2.

Rescind the fifth (last) paragraph of Subsection 208.03.3 (that begins, “Submit copies of…”) and replace with the following:

Submit copies of the plans and application packages, their modifications, or their revisions to the Project Manager. The Department will review each submittal of the plans and application packages, their modifications, or their revisions, and either request revisions or submit to applicable resource and regulatory agencies within 21 calendar days. Resource and regulatory agency review time does not begin until the Department submits the application to the applicable agencies. Do not begin work on temporary construction facilities or modifications to approved plans until receiving written notification from the Project Manager that all of the required approvals from the regulatory and resource agencies have been obtained and distributed. The Department will distribute COE 404 and SPA 124 approvals within 5 business days of receipt of all required approvals.

208.05 BASIS OF PAYMENT Page 137 4-16-15

Within the second paragraph, rescind the first sentence (that begins, “Failure to implement…”) and replace with the following:

Failure to provide erosion and sediment controls that prevent discharges to adjacent properties and/or aquatic resources, implement BMPs identified in the SWPPP, update the SWPPP as required by the Construction General Permit, or conduct BMP inspections and submit inspection reports renders the BMPs unacceptable.

208.05.1 TEMPORARY EROSION AND SEDIMENT CONTROL - LUMP SUM Page 138 2-26-15

Within Table 208-1, rescind the term “substantial work complete date” and replace with “Conditional final acceptance”.

Within the third paragraph, rescind the third sentence (that begins “Payment for quantities..”) and replace with the following:

Payment for quantities required by an event or extra work, and approved by the Project Manager, will be measured and paid for in accordance with the Erosion Control Rate Schedule contained in the contract at a unit price of $1.00 per unit.

Rescind the fourth paragraph (that begins, “The installation of additional…”) and replace with the following”

The installation of additional BMPs requested by the Department at the final inspection will be measured and paid for in accordance with the Erosion Control Rate Schedule.

212.01 DESCRIPTION Page 149 4-16-15

Rescind the first (only) paragraph (that begins, “Obliterate roadway…”) and replace with the following:

Obliterate roadway includes removal of the existing roadway and related items, rehabilitating the abandoned roadway area by scarifying and shaping, and re-vegetation.

212.03 CONSTRUCTION REQUIREMENTS Page 149 4-16-15

Within the third paragraph, rescind the third (last) sentence (that begins, “Spread the salvaged…”) and replace with the following:

Re-vegetate the disturbed areas in accordance with Section 610..

212.04 METHOD OF MEASURMENT Page 149 4-16-15

Rescind the second and third paragraphs and replace with the following:

Re-vegetation is measured and paid for in accordance with Section 610.

212.05 BASIS OF PAYMENT Page 149 4-16-15

Remove the following pay items and units from the table:

Pay Item	Pay Unit
Seeding	Acre (ha)
Topsoil	Cubic Yard (m^3)

301.02.4 AGGREGATE TREATMENT Page 151 1-18-18

Rescind the first paragraph (that begins, “Choose the material…) and replace with the following:

Choose the material that will be used to treat the aggregate, which may include MC-70, or calcium or magnesium chloride.

301.02.5 OPTIONAL RECYCLED MATERIAL Page 151 7-11-19

Add the following subsection:

301.02.5 Optional Recycled Material

RAP or Recycled Concrete Aggregate (RCA) may be blended with existing crushed aggregate course, additional aggregate course, or a combination of these. Ensure blended material meets the requirements of Subsections 701.02.1 and 701.02.4.

1. Pugmill recycled products with existing or virgin aggregates to produce a uniform mixture.
2. Blend no more than 40% RAP or 50% RCA by weight with existing or virgin aggregates.
3. Total recycled mixtures may not exceed 50% by weight of the blended base course.
4. Use weighing or metering devices to control the recycled material introduced into the mix within the specified limits.

301.03.1 SAMPLING, TESTING, AND ACCEPTANCE Page 151 4-25-19

Within Part(B), replace MT 217 with AASHTO T 335.

301.03.4 CRUSHED AGGREGATE COURSE Page 153 5-25-17

Within the third paragraph, rescind the first sentence (that begins, “Indicate the selected…”) and replace with the following:

Indicate the selected option and the grade of crushed base course (Type “A” grade 5, Type “A” grade 6, or Type “A” grade 7) before beginning aggregate production.

301.03.5 AGGREGATE SURFACING CONSTRUCTION Page 153 7-14-16

Within Part A, add the following Number 4:

4. Unstable or pumping material is unacceptable. Rework or remove and replace the material prior to placing additional lifts or materials.

Within Part H, Table 301-1 Surface Smoothness, replace the aggregate size (that specifies, “1-inch (25 mm) and less”) with the following:

Less than 1½-inch (40 mm)

302.02 MATERIALS Page 159 4-25-19

Add the following to the list of acceptable crushed aggregate courses:

Crushed Aggregate Course Type “A” Grade 7	701.02.4

304.02.4 BLENDING MATERIAL Page 163 4-25-19

Replace MT 208 with AASHTO T 89 and AASHTO T 90.

304.02.5 COMPOSITION AND PROPORTIONING Page 163 7-11-19

Within the first paragraph, rescind the first sentence (that begins, “Develop and submit…”) and replace with the following:

Develop and submit a proposed CTB or Cement Treated Pulverized Base mix design for approval.

Within Part 2, replace MT 211 with AASHTO T 134.

Within Part 7, replace MT 208 with AASHTO T 89 and AASHTO T 90.

Rescind Part 8 and replace with the following:

8. Sand equivalent determined in accordance with AASHTO T 176 alternate method No. 2 using stock solution with formaldehyde.

304.03.5 COMPACTION Page 165 4-25-19

Replace MT 211 with AASHTO T 134.

304.03.14 CEMENT TREATED PULVERIZED BASE Page 167 7-11-19

Add the following subsection:

304.03.14 Cement Treated Pulverized Base

When required by the Contract, process the existing plant mix surfacing with the existing base course and/or add crushed aggregate course and cementitious material as needed to restore the roadway section to the grade and dimensions shown in the Contract.

A. Requirements. Use equipment capable of pulverizing and mixing road sections to the depths shown in the plans. The equipment must be able to utilize a water spray or injection system capable of uniformly mixing the water, pulverized material and cementitious material together. Meet the construction requirements of Section 304 with the following exceptions:
   1. Begin production at the mix design targets for cementitious material and moisture content. Adjust cementitious material and moisture content as directed by the Project Manager to get compressive strengths between 500 and 1500 psi (35 and 104 KPa) as tested in accordance with MT 216. Changes in the amount of cementitious material used must be approved by the Project Manager.
   2. Immediately suspend operations due to detrimental weather conditions (e.g. wind and/or rain).
   3. Spread cementitious material uniformly on top of the pulverized surface. The spreading operation cannot exceed 1000 feet (300 m) ahead of the pulverizing operation.
   4. Perform mixing of cementitious material and pulverized base with pulverizing equipment.
   5. Shape the compacted surface to the specified lines, grades, and cross sections meeting the requirements of Subsection 105.08.
   6. Do not perform any subsequent work on the completed roadway sections until accepted by the Project Manager. Water must be introduced at the mixing stage. Water added after mixing and prior to compaction will not be allowed. Complete compaction within 2 hours after re-mixing is complete.

B. Sequencing.
   1. Pulverize the road to the specified depth and width as shown in the plans.
   2. Uniformly place cementitious material across the width of the roadway section on top of the pulverized base.
   3. Re-mix the pulverized sections and cementitious material with the pulverizing equipment.
   4. Compact the re-mixed and completed sections.
   5. Shape completed sections to the specified grade.
   6. Apply the curing seal and blotter.

304.04.4 CEMENT TREATED PULVERIZED BASE Page 167 7-11-19

Add the following subsection:

304.04.4 Cement Treated Pulverized Base

Cement Treated Pulverized Base is measured by the square yard (square meter) based on the designated width shown in the plans.

Crushed Aggregate Course is measured by the cubic yard (cubic meter) as a predetermined pay quantity as described elsewhere in this contract.

Portland cement is measured by the ton (metric ton) in accordance with Subsection 109.01. Fly ash, if included, is measured by the ton (metric ton) and the quantity added to the measured quantity of portland cement.

304.05 BASIS OF PAYMENT Page 167 7-11-19

Rescind Subsection 304.05 and replace with the following:

304.05 BASIS OF PAYMENT

304.05.1 Cement Treated Base

Payment for the completed and accepted quantities is made under the following:

Pay Item	Pay Unit
Blotter Material	Square Yard (m^2)
Cement Treated Base	Cubic Yard (m^3)
Curing Seal	Gallon (L) or Ton (MT)

No separate payment will be made for cement, fly ash, blending material or surface preparation. Include the cost in the unit price bid for CTB.

Payment at the contract unit price is full compensation for all necessary resources to complete the item of work in accordance with the contract.

304.05.1 Cement Treated Pulverized Base

Payment for the completed and accepted quantities is made under the following:

Pay Item	Pay Unit
Blotter Material	Square Yard (m^2)
Cement Treated Pulverized Base	Square Yard (m^3)
Cement	Ton (metric ton)
Crushed Aggregate Course	Cubic Yard (cubic meter)
Curing Seal	Gallon (L) or Ton (MT)

No separate payment will be made for blending material or surface preparation. Include the cost in the unit price bid for CTB.

Payment at the contract unit price is full compensation for all necessary resources to complete the item of work in accordance with the contract.

401.01 DESCRIPTION Page 169 5-25-17

Rescind the second paragraph (that begins, “Plant mix pavement…”) and replace with the following:

Plant mix pavement is 1 or more courses of plant mixed aggregate, hydrated lime, chemical additive if used, and bituminous material, constructed on a prepared foundation.

401.02 MATERIALS Page 169 5-25-17

Rescind the third paragraph (that begins, “Ensure that the…”) and replace with the following:

Ensure that the aggregate, when combined at the job mix formula (JMF), meets Table 701-15, and Subsection 701.03.1.

401.02.1 AGGREGATE Page 169 7-11-19

Add the following paragraph to the end of the subsection:

When ¾-inch non-commercial plant mix is specified, the Contractor may request to substitute ½-inch non-commercial plant mix for the ¾-inch non-commercial plant mix prior to submitting a mix design. The Department will execute a no cost change order replacing the ¾-inch plant mix item with the ½-inch plant mix item.

401.02.5 RECYCLED ASPHALT PAVEMENT (RAP) Page 170 7-14-16

Resind Subsection 401.02.5 and replace with the following:

401.02.5 Binder Replacement

A portion of the asphalt binder may be obtained from either RAP and/or recycled asphalt shingles (RAS). Do not use RAS when producing warm mix. Inclusion of recycled materials will be evaluated by percent binder replacement, the ratio of the recycled binder to the total binder. Meet the requirements of the Table 401-6.

TABLE 401-6
MAXIMUM ALLOWABLE PERCENT BINDER REPLACEMENT

Recycled Material	Replacement Allowed	
	Lower Layers	Upper Layer (top 0.15-feet)

RAS (used alone)	15	15
RAP	35	25
RAP and RAS (combination)[1]	25	25

Note 1: When using RAS in combination with RAP, ensure the RAS does not exceed 3% by weight of the total aggregate blend.

If binder replacement is included in the job mix formula and the final mix, meet all of the plant mix requirements. Utilize separate stockpiles and feeds for each recycled component.

It is recommended that at least 2 separate RAP stockpiles be produced.

Furnish RAS in accordance with AASHTO MP 23-145. The specific gravity of the RAS may be obtained in accordance with AASHTO PP 78. If RAS is used, meet the requirements of Table 401-7:

TABLE 401-7
TABLE OF GRADATIONS - RAS

Percentage By Weight Passing Square Mesh Sieves	
Sieve Size	Percent Passing
⅜-inch (9.5 mm)	100
No. 4 (4.75 mm)	93

401.03 CONSTRUCTION REQUIREMENTS Page 170 5-25-17

Rescind the fourth paragraph (that begins, “For non-commercial mix …”) and replace with the following:

For non-commercial mix, set the initial job mix targets before producing more than 2000 tons (2000 MT) of plant mix surfacing. Plant mix produced prior to setting initial targets is defined as start-up mix. Furnish the Project Manager 1 copy of form CB30QA-VM (S) with the proposed job mix targets for VMA, VFA, VTM, and D/A. Once the job mix targets are set, Quality Assurance (QA) will be applied to all subsequent plant mix produced. No pay incentive will be applied to the plant mix until the targets are set. Produce start-up mix meeting the criteria listed in accordance with the Start-Up Job Mix Range in Table 701-18. A Hamburg wheel track test (Hamburg) will be performed in accordance with Subsection 401.03.2 when the produced mix does not meet all the criteria specified in accordance with the start-up job mix range in Table 701-18.

Within the fifth paragraph, rescind the fourth sentence (that begins, “Submit to the…”) and replace with the following:

Submit to the Project Manager 1 signed copy of form CB30-QA-VM (S) with the revised job mix targets for VMA, VFA, VTM and D/A.

401.03.1 MIX DESIGN Page 171 9-20-18

Within the first paragraph, following the first sentence (that begins, “Submit to the…”) add the following sentences:

Use form MDT-MAT-009 as a mix design cover sheet. Ensure all fields are completed. The mix design and cover sheet may be submitted electronically. Mix designs submitted without the cover sheet or submitted with a cover sheet that doesn’t contain all the applicable information will be rejected.

Within the first paragraph, rescind the eighth sentence (that begins, “For mix designs using…”) and replace with the following:

For mix designs using binder replacement, furnish the asphalt content and gradation of each recycled component and furnish the total asphalt content and Job Mix Formula gradation including the RAP/RAS.

Rescind the second paragraph (that begins, “Furnish samples of…”) and third paragraph (that begins, “The Department has…”) and replace with the following:

Furnish samples of material from each stockpile. Ensure samples represent the stockpiles and mix design to be used on the project. Provide at least 800 pounds of aggregate, which can be appropriately proportioned to match the mix design. If the aggregate submitted cannot be appropriately proportioned to the submitted JMF, the mix design will be rejected and the mix design verification process will start over. A total weight of 600 pounds is allowed if the mix design includes Hamburg testing results. Furnish 5 gallons (19 L) of the specified asphalt binder or indicate consent to use binder of the same source and grade provided from the Department’s supply. Furnish 5 pounds of hydrated lime or indicate consent to use lime of the same source provided from the Department’s supply.

The Department has 30 calendar days from receipt of the mix design materials and signed mix design documents to review/verify the mix design. Mix design verification consists of:

- Ensuring less than 13.0 mm of rut at 15,000 passes during Hamburg testing;
- A review of the submitted mix design documents to ensure all applicable design and aggregate requirements have been met; and,
- Testing of the submitted aggregate for conformance with Subsection 701.03.

Hamburg test results may be submitted with the mix design. Ensure Hamburg testing is done in accordance with MT 334. The Department reserves the right to verify any Hamburg results.

Tensile strength ratio test results do not have to be submitted with the signed mix design documents but must be received and reviewed before a mix design will be considered verified. Contract time will be extended for the actual contract time the Contractor's paving start date was delayed, as verified by their most recent submitted schedule, and only for contract time assessed after the 30 day verification time frame. No additional compensation is allowed for these Department-caused delays. Contract time will not be extended if the delay occurs between November 1st and April 15th.

Rescind the fifth paragraph (that begins, "A change in…") and sixth paragraph (that begins, "In lieu of…") and replace with the following:

A change in the asphalt supplier or aggregate source(s) will not require a new mix design, provided no change in the established job mix targets is requested, and the aggregate and Hamburg requirements are met. If a change in the asphalt supplier or aggregate source is requested after mix design verification by the Department but before production begins, targets must be set before laydown operations begin and all mix will be considered production mix. During start up, establish job mix targets immediately if changing asphalt supplier or aggregate source prior to setting initial targets on non-commercial mix projects. For commercial mix, any mix produced after a change in supplier will be considered production mix and subject to full disincentives. Provide the apparent and bulk dry specific gravities and absorption for the aggregate, and the specific gravity for asphalt cement when there are changes in the source(s).

In lieu of developing a new mix design, a previous Department verified mix design may be requested for transfer. To be eligible for transfer, the transferred mix design must utilize the same material constituents, from the same sources, and in the same proportions as the original mix design. Any request for transfer must be made at least 10 business days in advance of paving. Mix design transfers will not be considered if the design traffic warrants different mix design criteria. Approval for transferring a mix design is at the discretion of the Department and may require Hamburg testing or aggregate consensus properties re-verification. Proposed transfers with variations to the original mix design such as asphalt supplier or other factors such as changes to the crushing operation which could create uncertainty in the performance of the mix design will be subject to re-verification testing. When submitting a request for a mix design transfer, furnish quantities from each stockpile to produce a 300-pound (136 kg) sample if the Department determines Hamburg testing re-verification is necessary. Submit form MDT-MAT-009 with any mix transfer request.

401.03.2 HAMBURG WHEEL TRACK TESTING (HAMBURG) Page 171 11-16-17

Rescind Subsection 401.03.2 and replace with the following:

401.03.2 Hamburg Wheel Track (Hamburg) Testing and Acceptance

A. Hamburg Testing. Furnish a sample of plant mix surfacing material for Hamburg acceptance after initial job mix targets have been established for non-commercial mix. Furnish additional samples as directed by the Project Manager. The Department may require Hamburg samples at any time. Hamburg samples may be run on the applicable gyratory pucks and/or in-place mix represented by the pucks. Hamburg test results for the initial target set will be furnished to the Contractor within 7 business days. Hamburg test results in all other cases will be furnished to the Contractor as soon as they are available.

   If plant mix fails exceeds 13.0 mm of rut in 10,000 passes during production Hamburg testing, make adjustments to produce plant mix meeting the requirements specified in the contract. After a failing Hamburg no more than 300 tons (300 MT) of plant mix may be produced until passing Hamburg results are received.

   When 2 consecutive Hamburg samples do not meet the requirements, suspend production and submit a revised mix design and samples for verification and Hamburg testing. The initial mix design requirements will be used for verification. Do not resume production until the revised mix design is verified and Hamburg mix design requirements are met.

   Plant mix lots represented by samples that do not meet Hamburg specifications are not eligible for QA incentives including ride and density incentives.

   Remove and replace any plant mix represented by a failing Hamburg test. Plant mix removal and replacement is at no cost to the Department.

B. Hamburg Acceptance. Plant mix removal and replacement is at no cost to the Department.
   1) PG 70-XX. Plant mix exceeding 13.0 mm of rut depth within 10,000 passes during production Hamburg testing is considered failing material. Remove and replace any plant mix represented by a failing Hamburg test.
   2) All other PG Grades. The number of wheel passes reached when the rut depth reaches 13.0 mm will be used to determine the pay factor. The pay factor for the material represented by each test is determined from the following tableTable 401-8:.

TABLE 401-8
HAMBURG TESTING PAY FACTORS

PG 58-XX and 64-XX	
# of wheel passes	Pay factor
x 10,000	PF = 1.0
10,000 > x 8,000	$PF = 1.00 - \frac{0.50(10000 - x)}{2000}$
x < 8,000	PF = 0, Remove and Replace [1]

Note 1: In the areas listed below, material represented by Hamburg tests exceeding 13.0 mm of rut between 6,000 and 8,000 passes, may remain in place at a 0.5 pay factor:

- Bicycle, pedestrian, or shared use (non-vehicular) paths
- Roadway shoulders, only if the entire width of the paver pass occurred within the width of the shoulder.
- Lower layers below 0.25 feet from the finished surface of plant mix.

Remove and replace plant mix exceeding 13.0 mm of rut in less than 6,000 passes.

The above exclusions do not apply if the entire thickness section of plant mix is not completed prior to winter suspension.

401.03.3 TEST PROCEDURES Page 172 4-25-19

Replace MT 314 with AASHTO T 166.

Add the following paragraph following the test procedures:

When material is tested in accordance with MT 332, if the height of gyratory specimens is out of tolerance, an evaluation will be conducted to determine if the specimen will be retained or discarded. The Department will check plant production information, test equipment, processes, calculations, etc. for issues. If a problem is noted in processes controlled by the Contractor, the test will be considered valid. If a problem is found with the testing or other Department process, or no issues with Contractor production are identified, the test will be redone on material from the same sample, if possible. If a non-correctable testing problem is found, the specimen will be discarded.

401.03.4(A) JOB MIX FORMULA Page 172 5-25-17

Within the first paragraph, rescind the first sentence (that begins, “Establish target asphalt…”) and replace with the following:

Establish target asphalt cement, warm mix additive content (if applicable), and aggregate gradation.

401.03.5 ACCEPTANCE COMMERCIAL PLANT MIX SURFACING Page 172 10-9-14

Rescind the second paragraph (that begins, “A $3.00/ton…”) and replace with the following:

For the first 1000 tons (1000 MT), a $3.00/ton maximum price reduction in the unit bid price for plant mix surfacing will be applied for any mix represented by a test not meeting the VMA, VFA, VTM, or D/A specified. A $3.00/ton price reduction ($9.00/ton maximum) in the unit bid price for plant mix surfacing will be applied to any subsequent mix for each test not meeting the VMA, VFA, VTM, or D/A specified. Price reductions will be assessed on the quantity of material represented by each failing sample. The quantity of material represented by each sample is the total tons of material produced divided by the total number of samples representing the material.

401.03.6 ACCEPTANCE OF NON-COMMERCIAL PLANT MIX SURFACING (QA) Page 173 8-6-15

Rescind the first paragraph of Subsection 401.03.6 (that begins, “The properties listed…”) and replace with the following:

For the start-up mix, a $3.00/ton price reduction ($9.00/ton maximum) in the unit bid price for plant mix surfacing will be applied for each test not meeting the VMA, VFA, VTM, or D/A specified. Price reductions will be assessed on the quantity of material represented by each failing sample. The quantity of material represented by each sample is the total tons of start-up mix produced divided by the total number of samples representing the material.

Once targets have been set, the properties listed in Table 701-18 for non-commercial plant mix are designated for acceptance on a lot-by-lot basis in accordance with Subsection 105.03.2. The pay factor in Table 401-1 is applied to plant mix surfacing lots for VMA, VFA, VTM and D/A. The asphalt content used for calculations is determined in accordance with MT

319. The D/A is calculated in accordance with MT 319, and the gradation determined in accordance with MT 320 on the aggregate remaining after the ignition oven test.

401.03.17 TACK COAT Page 178 8-6-15

Rescind the second paragraph (that begins, “Apply tack coat on…”) and replace with the following:

Apply tack coat on aggregate treated surfaces, existing surfacing to be overlaid and between lifts when pavement is constructed in multiple lifts.

401.03.18 SURFACE CONDITIONS, WEATHER LIMITATIONS AND PAVING DATES Page 178 11-16-17

Within the second paragraph, rescind the first sentence (that begins, “Complete all sections…”) and replace with the following:

Complete all sections of plant mix surfacing, to be open to traffic during winter suspension, to the full plan width and thickness, excluding the seal and cover.

401.03.21 COMPACTION, COMPACTION CONTROL TESTING, AND DENSITY ACCEPTANCE TESTING Page 180 4-25-19

Rescind the fifth paragraph (that begins, “Provide core samples…”) and replace with the following:

Provide core samples of the compacted plant mix from the roadway. Core locations will be randomly selected based on the tons (MT) of mix placed. Core the locations selected after all rolling is complete and before the roadway is opened to traffic. The center of the core location will not be within 12 inches (305 mm) of unconfined longitudinal paving joints, 12 inches (305 mm) of a shoulder hinge point, or where the planned nominal thickness is less than 0.10-foot (30 mm). The center of the core locations for vertically confined longitudinal joints may be placed within 5 inches (125 mm) of the joint. The pavement density is determined from cores taken at randomly selected locations after all rolling is complete and before the roadway is open to traffic.

Within the seventh paragraph (that begins, “Take cores after…”) rescind the first sentence (that begins, “Take cores after…”).

Replace MT 314 with AASHTO T 166.

401.03.23(A) RIDE SPECIFICATION Page 181 11-16-17

Rescind the first and second paragraphs and replace with the following:

A. Ride Specification. Construct all surfacing courses to provide completed plant mix pavements that meet surface smoothness and profile levels derived from the pre-pave IRI. Surface smoothness and surface profile will be analyzed from data collected by the Department using a Class I laser road profiler following Department procedures for profiler operations. The IRI will be measured in inches/mile, regardless of the unit of measure used on the contract.

Projects with high pre-paving IRI value:

- Projects with an average pre-paving IRI value greater than or equal to 190 in/mi and 2 or more opportunities to improve the ride are considered a Category I project.
- Projects with an average pre-paving IRI value greater than or equal to 190 in/mi and one opportunity to improve the ride must have a post-paving IRI less than or equal to 50% of the pre-paving IRI. There is no pay adjustment factor based on smoothness; corrective action is required to produce a post-paving IRI less than or equal to 50% of the pre-paving IRI at Contractor expense.

Each opportunity to improve the ride is one of the following:

- Placing a gravel base or surfacing course;
- Placing plant mix base;
- Placing cement treated base;
- Placing pulverized plant mix surfacing;
- Milling;
- Hot or cold recycling (milling and laydown); or
- Each full 0.10-foot 3 incre ent for ⅜-inch (9.5 mm) aggregate mix, 0.12 foot (36 mm) increment for ½-inch (12.5 mm) aggregate mix, and 0.15-foot (45 mm) increment for ¾-inch (19 mm) aggregate mix of new plant mix surfacing.

Target IRI values are determined by project category based on the opportunities for improving the ride, by the pre-paving IRI value, paving constraints or by a combination of these as follows:

Category I projects:
Target IRI values - 45 to 55 inches per mile
- Projects with 2 or more opportunities for improving the ride.
- Single lift overlays with a pre-paving IRI value less than 110 in/mi

Category II projects:
Target IRI values - 55 to 60 inches per mile
- Single lift overlays with a pre-paving IRI greater than or equal to 110 in/mi and less than 190 in/mi

Category III projects:
Target IRI values - 55 to 70 inches per mile
- Urban projects with a posted speed limit of 55 MPH or less and curb and gutter controlling 1 or more edges of the paving

Leveling and isolation lifts are not included as an opportunity to improve the ride.

Within the fifth paragraph, rescind the last sentence (that begins, “Fog seal corrected…”) and replace with the following:

Fog seal corrected areas if the roadway is not chip sealed prior to winter suspension.

Within the sixth paragraph, rescind the third sentence (that begins, “Data collected for…”) and replace with the following:

For each pass, data collected for each wheel path will be averaged for that lane. The results of the two passes will then be averaged to arrive at a result for that lane.

Within the seventh paragraph, rescind the first sentence (that begins, “If the entire…”) and replace with the following:

If the entire final lift of pavement cannot be completed before winter suspension, data will be collected for all roadway sections paved through the final lift.

401.03.23(B) SURFACE SMOOTHNESS Page 183 7-14-16

Rescind Table 401-4 and replace with the following:

TABLE 401-4
MAXIMUM ALLOWABLE VARIANCE AND DIVERGENCE

Surface	Total Variation Per 100 feet	Rate
New plant mix	0.02-foot (6 mm)	0.20%
lant ix o erla s 3-foot (90 mm)	0.03-foot (9 mm)	0.30%
Plant mix overlays < 0.3-foot (90 mm)	0.03-foot (9 mm)	no rate

Note: The rate is applicable only to the longitudinal direction.

401.03.24 RUMBLE STRIPS Page 184 11-16-17

Within the fourth paragraph, rescind the first sentence (that begins, “Do not cut…”) and replace with the following:

Do not cut rumble strips if the seal and cover operation will not be completed before winter suspension.

402.03 CONSTRUCTION REQUIREMENTS Page 187 10-9-14

Rescind the first (only) paragraph (that begins, “Mix and apply…”) and replace with the following:

Mix and apply bituminous material meeting the applicable requirements in Sections 401, 407, 409, and 410.

402.03.5 ACCEPTANCE Page 188 7-14-16

Rescind Part (B) and replace with the following:

B. Failures. If a shipment of bituminous material fails to meet any one of the specifications, with test results within the allowable variation in table 402-1, the price reduction will be 10%.
If a shipment fails to meet any one of the specifications with test results in excess of the allowable variation in table 402-1 but less than twice the allowable variation, the price reduction will be 15%.

If a shipment fails to meet any one of the specifications with test results in excess of twice the allowable variation in table 402-1 but less than three times the allowable variation, the price reduction will be 25%.

If a shipment fails to meet any one of the specifications with test results in excess of three times the allowable variation in table 402-1, the Project Manager may reject the material and require its removal from the work, or the Project Manager may accept the material at a 50% price reduction.

The cost of the bituminous material for calculating price reductions is the material's contract unit price. The price reduction percentage will be based on the unit price bid for bituminous material when it is paid as a separate item or the invoice price when it is part of a bid item.

If a shipment fails more than one of the specifications, the failure causing the largest percentage price reduction is assessed.

Within Table 402-1, Schedule of Tolerances, rescind the term "Allowable Variation" from within the heading and replace with "Variation".

402.04 METHOD OF MEASURMENT Page 192 10-9-14

Within the sixth (last) paragraph, rescind the first sentence (that begins, "Use flow rate…") and replace with the following:

Use flow rate meters in accordance with Subsection 401.03.12, to measure the material.

403.02 MATERIALS Page 193 8-6-15

Rescind Subsection 403.02(A) and replace with the following:

A. Crack Sealant. Use a sealant that is listed on the QPL and in accordance with Subsection 707.01.

Rescind Subsection 403.02(B) and replace with the following:

B. Backer Rod. Furnish backer rod that is listed on the QPL. Furnish backer rod in accordance with ASTM D5249, Type 1. The backer rod used must be compatible with the crack sealant placement temperature and sized for cracks in accordance with Subsection 403.03.4.

403.03.4 SEALING Page 194 12-11-14

Within the first paragraph, rescind the third (last) sentence (that begins, "Do not rout further…") and replace with the following:

Place sealant material within 24 hours of routing.

409.02.2 BITUMINOUS MATERIAL Page 197 5-25-17

Rescind the first (only sentence (that begins, "Furnish material in…" and replace with the following:

Furnish material in accordance with Section 702.

409.03.1 SAMPLING, TESTING, AND ACCEPTANCE Page 197 4-25-19

Replace MT 217 with AASHTO T 335.

409.03.3 SEAL COAT LIMITATIONS Page 198 2-26-15

Add the following to the end of the list:

7. Do not apply bituminous material within 72 hours of performing crack sealing.

409.03.10 SWEEPING AND BROOMING Page 199 7-14-16

Rescind the first paragraph (that begins, "Provide a roadway…") and replace with the following:

Provide a roadway free of loose cover material. In curb and gutter sections, remove and dispose of all loose cover material from the roadway and sidewalks. Do not allow material to enter any storm drain system or aquatic resource. In guardrail sections, do not allow loose cover material to accumulate beneath the rail.

Rescind Subsection 409.03.10(B) and replace with the following:

B. Final Sweeping and Brooming. Perform final sweeping and brooming operations to remove excess loose material no sooner than 5 calendar days before final pavement markings. Coordinate with the Project Manager to ensure Final Sweeping and Brooming is necessary. Provide traffic control in accordance with Section 618.

501 PORTLAND CEMENT CONCRETE PAVEMENT Page 209 *11-14-19

Rescind Section 501 and replace with the following:

SECTION 501
PORTLAND CEMENT
CONCRETE PAVEMENT

501.01 DESCRIPTION

This work is the construction of PCCP on a prepared subgrade or base course.

501.02 MATERIALS

501.02.1 Concrete

Furnish concrete in accordance with Section 551 for Class Pave concrete.

A. Cement. Furnish Type I, II, V, IS, IP, or IT portland cement listed on the QPL, in accordance with Subsection 551.02.1.

B. Aggregate. Use optimized gradations unless otherwise specified. Furnish aggregate in accordance with Subsection 701.01.2 having a wear factor not exceeding 30%.

501.02.2 Reinforcing Steel

Steel-wire fabric and steel bar mat sizes and dimensions are specified in the contract.

Furnish steel-wire fabric reinforcement in flat sheets.

Furnish bar mats and bars of structural or intermediate grade, as specified in the contract.

Furnish all reinforcing steel in accordance with Section 555 and Subsection 711.01.

501.02.3 Dowel Bars and Sleeves

Furnish Grade 40 or 60 plain round dowel bars in accordance with AASHTO M 31.

Epoxy coat the dowel bars in accordance with AASHTO M 254 at 10 ±2 mils. Ensure the bars are coated by an applicator plant listed on the QPL and certified under the CRSI epoxy coating plant certification program for fusion-bonded epoxy applicator plants.

Do not use bars having burrs or other deformation that restrict slipping in the concrete.

Provide dowels with a factory applied petroleum, paraffin-based lubricant with a manufacturer certified use as a bond breaker.

Furnish sleeves for dowel bars meeting the contract requirements.

501.02.4 Tie Bars

Furnish Grade 40 or 60 deformed steel bars in accordance with AASHTO M 31 and Subsection 711.01.2. The length, size, and spacing of the bars are specified in the contract.

501.02.5 Expansion Joint Filler and Joint Sealing Material

Furnish expansion joint filler and joint sealing material listed on the QPL and in accordance with Subsection 707.01.

501.02.6 Curing Compound

Furnish Type 2 curing compound listed on the Department's QPL and in accordance with Subsection 717.01.3.

501.03 CONSTRUCTION REQUIREMENTS

501.03.1 Equipment

A. General. Do not begin paving operations until all equipment and tools for the pavement construction are available at the site.

Use handling, batching, mixing, and concrete transporting equipment in accordance with Section 551 and the following.

Use batch plants that proportion aggregates and cement by weight using automatic and interlocked proportioning devices. For placements up to 1000 square yards (836 m^2), approval may be requested to use manual plants.

Use hauling equipment in accordance with Subsection 551.03.4. Remove and dispose of concrete remaining in haul units before reloading with fresh concrete. If using non-agitating hauling equipment, ensure smooth, mortar-tight metal bodies that completely discharge the concrete at a uniform rate without segregation. Provide covers when necessary to prevent the concrete from drying out or being exposed to weather-related moisture. Plant-mixed concrete may be transported in non-agitating vehicles provided that concrete is in a workable condition when placed and:

Discharge is completed within 45 minutes after the introduction of mixing water to the cement and aggregates, or

1. Discharge is completed within 60 minutes after the introduction of mixing water to the cement and aggregates, provided the concrete mix temperature is 70°F (21 °C) or below during placement, or

2. Discharge is completed within 60 minutes after the introduction of mixing water to the cement and aggregates, provided the mix contains an approved set retarder used in accordance with subsection 551.03.3.

B. Slip-Form Paver. Use a self-propelled slip-form paver capable of consolidating, screeding, and float-finishing freshly placed concrete in one complete pass of the machine for the required thickness. Use machines equipped to internally vibrate the concrete for the full width and depth placed in a single pass as required to produce a dense, homogeneous pavement. Ensure the rate of vibration of each vibrating unit is at least 7,500 cycles per minute. Ensure the vibration is sufficient to be perceptible on the surface of the concrete along the entire length of the vibrating unit and for a distance of at least 1-foot. Vary the frequency or amplitude of vibration proportionately with the rate of travel to result in a uniform density and air content. Ensure the paving machine is equipped with a tachometer or other suitable device for measuring and indicating the actual frequency of vibrations.

Ensure equipment can produce the frequency and amplitude the paver manufacturer recommends for the placement at hand.

C. Stationary Side Forms. Use clean, straight, un-warped steel forms with a vertical face of appropriate for the depth of placement. Ensure that forms have side and base supports capable of supporting finishing equipment and are sufficiently strong to resist concrete pressure without bulging.

Wood or plastic forms for forming fillets, widened areas in intersections, curves less than 100-foot radius (30 m), and in other engineer-approved locations.

D. Finishing Equipment for Stationary Side Forms.

Bridge Deck Finishing Equipment. Use transverse-finishing rotating drum bridge deck finishing machines

Truss Screeds. Use air-vibrated or mechanically-vibrated truss screeds designed for and capable of striking off the placement.

Joint Sawing Equipment. Provide wet-cut saws for joint establishment in the all concrete.

When using early-entry saws, use saw blades and skid plates specifically designed for the type coarse aggregate used in the concrete in accordance with the saw manufacturer’s recommendation.

F. Hand Finishing Tools. Use aluminum, magnesium, or wooden hand finishing tools. Do not use steel had finishing tools.

501.03.2 Pre-paving Conference

Schedule a pre-paving conference to be held at least 72 hours before paving starts.

Submit an agenda to include equipment, construction methods, specification requirements, and lines of communication.

The conference must include the foreman, subcontractors/suppliers, other Contractor personnel that will supervise the concrete paving operations, and key Department inspection personnel.

501.03.3 Mixing

Mix concrete in accordance with Subsection 551.03.3.

501.03.4 Transporting Concrete

Transport concrete in equipment in accordance with Subsections 501.03.1 and 551.03.4.

501.03.5 Placing and Finishing Concrete

Concrete will be tested and accepted in accordance with Section 551.

A. Slip-form Method. Uniformly distribute concrete into final position by a self-propelled slip-form paver without delay. Regulate the alignment and elevation of the paver from outside reference lines established for this purpose, or by an electronic control system capable of controlling the line and grade within required tolerances. Ensure the paver vibrates the concrete for the full width and depth of the strip of pavement being placed and the vibration is adequate to provide a consistency of concrete that stands normal to the surface with sharp well-defined edges. Ensure the sliding forms are rigidly held together laterally to prevent spreading.

Ensure the plastic concrete is effectively consolidated by internal vibration with transverse vibrating units for the full width of pavement and/or a series of equally spaced longitudinal vibrating units. The space from the outer edge of the pavement to the outer longitudinal unit must not exceed 9 inches (230 mm). The spacing of internal units must be uniform and not exceed 18 inches (455 mm).

The term internal vibration means vibration by vibrating units located within the specified thickness of pavement section.

Hold the concrete at a uniform consistency. Operate the slip-form paver with as nearly a continuous forward movement as possible. Coordinate all operations of mixing, delivering, and spreading concrete to provide uniform progress with stopping and starting of the paver held to a minimum. If, for any reason, it is necessary to stop the forward movement of the paver, the vibratory and tamping elements shall also be stopped immediately. Do not apply tractive force to the machine, except that which is controlled from the machine.

When concrete is being placed adjacent to an existing pavement, equip that part of the equipment which is supported on the existing pavement with protective pads on crawler tracks or rubber-tired wheels on which the bearing surface is offset to run a sufficient distance from the edge of the pavement to avoid breaking the pavement edge.

B. Stationary Side Form Method. Before placing side forms, ensure the underlying material is at the proper grade. Side forms shall be placed to the required grade and alignment of the edge of the finished pavement. Wood wedges may be used to adjust the form elevation provided they do not extend into the concrete. The forms shall be firmly supported during the entire operation of placing, compacting, and finishing the pavement.

Drill forms in advance of being placed to line and grade to accommodate tie bars where these are specified.

Ensure side forms remain in place at least 12 hours after the concrete has been placed, and in all cases until the edge of the pavement no longer requires the protection of the forms. Apply curing compound to the concrete immediately after the forms are removed.

Thoroughly clean and oil side forms each time they are used and before concrete is placed against them.

Spread, screed, shape, and consolidate concrete by one or more self-propelled machines. Ensure these machines uniformly distribute and consolidate concrete without segregation so that completed pavement will conform to required cross section with a minimum of handwork.

Ensure the number and capacity of machines furnished is adequate to perform the work required at a rate equal to that of concrete delivery.

Effectively consolidate concrete for the full paving width by means of surface vibrators, in combination with internal vibrators, or by some other method of consolidation that produces equivalent results without segregation.

When vibrators are used to consolidate concrete, ensure the rate of vibration is at least 3,500 cycles per minute for surface vibrators and is at least 7,000 cycles per minute for internal vibrators. Ensure the amplitude of vibration is sufficient to be perceptible on the surface of the concrete more than 1-foot from the vibrating element. Furnish a suitable device for measuring and indicating frequency of vibration. Connect power to vibrators so that vibration ceases when forward or backward motion of the machine is stopped.

C. Final Surface Finish. Hand-float the surface only as needed to produce a uniform surface and sharp corners. Adding finishing water to unfinished concrete is prohibited. Do not use excess mortar to build up slab edges or round the slab corners. Before the concrete's initial set, work the pavement edges along each side of transverse isolation joints, transverse construction joints, and fixed forms to produce a ¼-inch (6 mm) continuous radius and a smooth, dense mortar finish. Check the surface of the fresh concrete with a long-handled straightedge that is 10 feet (3 m) or longer. Remove high areas indicated by the straightedge.

D. Texturing. Longitudinally tine all pavements unless transverse tining is allowed as described below. In advance of curing operations, where longitudinal tining is required, complete initial and final texturing on the pavement. Perform initial texturing with a burlap drag or broom device that produces striations parallel with the centerline. Perform final texturing with a wire comb tine device that produces grooves parallel with the centerline. Operate the wire comb tine device within 5 inches (125 mm), but not closer than 3 inches (75 mm), of pavement edges.

Ensure burlap drags, brooms, and tine devices are installed on self-propelled equipment having external alignment control. Ensure the area of burlap in contact with the pavement surface is always constant. Include positive elevation control on broom and tine devices. Maintain downward pressure on pavement surface during texturing to achieve uniform texturing without measurable variations in pavement profile. Maintain constant travel speed during texturing. Ensure the wire comb of the final texturing device is rectangular in cross section, 3/32 to 1/8-inch wide, on ¾-inch centers, ± 1/8-inch, and of sufficient length, thickness, and resilience to form grooves approximately 1/8-inch deep in the fresh concrete surface. Ensure final texture is uniform in appearance with substantially all the grooves having a depth between 1/16 and 3/16-inch.

On projects requiring less than 1,000 square yards (836 m^2) of cement concrete pavement, for irregular areas or areas not accessible to slip-form pavers, the surface finish may be either longitudinal tined or transverse tined. Complete transverse tining by texturing with a wire comb perpendicular to the centerline. Ensure the wire comb of the final texturing device is rectangular in cross section, 3/32 to 1/8-inch wide, on ¾-inch centers, ± 1/8-inch, and of sufficient length, thickness, and resilience to form grooves approximately 1/8-inch deep in the fresh concrete surface. Ensure final texture is uniform in appearance with substantially all the grooves having a depth between 1/16 and 3/16-inch. Ensure the elements of the wire comb as nearly perpendicular to the concrete surface as is practical, to eliminate dragging the mortar.

Regardless of the surface finish, if the pavement has a raised curb end the texturing 2 feet (610 mm) from the curb line.

501.03.6 Protection of Concrete from Adverse Weather

Maintain materials at the project site to protect all un-hardened concrete surfaces from rain, hail, or snow.

When adverse weather appears imminent, stop paving operations and cover all surfaces of the un-hardened concrete with the protective covering. Do not finish rainwater, hail, or snow into the concrete surface.

501.03.7 Evaluation and Repair of Weather -Damaged Concrete

Cease operation when rain is threatening. Remove, replace, or repair any pavement damaged by rain, hail, or snow as determined by the Project Manager. Pavement is considered damaged when rain, hail, or snow leaves noticeable texture on the surface.

All protective, remedial, and corrective work to produce acceptable pavement is at Contractor expense.

501.03.8 Curing

Immediately after finishing operations have been completed and marring of the concrete will not occur, cure the entire surface of the newly placed concrete in accordance with Subsection 551.03.7 and one of the following methods.

A. Membrane. Before application, agitate the curing compound as received in the shipping container to obtain a homogenous mixture. Protect membrane curing compounds from freezing. Handle and apply the membrane curing compound in accordance with the manufacturer's recommendations and the following:
   1. Apply compound to the entire area of the exposed surface of the concrete with an approved mechanical spray machine at a rate of one gallon to not more than 150-square feet (14 m^2).
   2. Apply curing compound homogeneously to provide a uniform, solid, white opaque coverage on all exposed concrete surfaces (equal to a white sheet of typing paper) at the time of application.
   3. Immediately re-apply compound to damaged areas protected for less than 72 hours by spraying.
   4. If the Project Manager determines that the initial or corrective spraying result in unsatisfactory curing, the Project Manager may require the Contractor to use the White Polyethylene Sheeting method, at no additional cost to the Department.

Use a fully automatic, self-propelled mechanical power sprayer to apply the curing compound in accordance with the following:

1. Operate the equipment to direct the curing compound to the surface from two different lateral directions.
2. Do not allow the sprayer to ride on the pavement surface.
3. Ensure the sprayer covers the entire lane width and atomizes the curing compound.
4. If puddling, dripping, or non-uniform application occurs, suspend the operation to perform corrections as approved by the Project Manager.
5. Ensure the sprayer is equipped with the following:
   a. A re-circulating bypass system that provides for continuous agitation of the reservoir material,
   b. Separate filters for the hose and nozzle,
   c. Check valve nozzles,
   d. Multiple or adjustable nozzle system that provides for variable spray patterns,
   e. A shield to control loss of material by wind action, and
   f. A spray-bar drive system that operates independently of the wheels or track drive system.

   For pavements less than 1000 square yards (836 m^2) and for irregular or narrow surfaces, submit a curing plan to the Project Manager for approval including equipment proposed for use.

   Do not apply curing compound to the inside faces of joints to be sealed.

   Do not apply curing compound during rain. Have enough material on the project to immediately suspend membrane curing and begin polyethylene sheeting in accordance with Subsection 501.03.11(B). Cover all concrete previously placed that is subject to damage or loss of curing compound. Repair all concrete damaged by rain to the Project Mangers approval and at no cost to the Department.

B. White Polyethylene Sheeting. Furnish sheeting in accordance with Subsection 717.01.5. Place sheeting over the pavement immediately after finishing operations are completed.

   Place the sheeting so that individual sheets cover the entire pavement width and overlap longitudinally a minimum of 2 feet (610 mm). Ensure the lapped areas are held in close contact with the pavement by weighting sufficiently to prevent movement by the wind. Extend the sheeting downward to cover the edges of the pavement and secure to the subgrade. Cover any holes or exposed concrete immediately. Maintain the sheeting against injury and ensure complete coverage until the pavement has reached a minimum compressive strength of 2,500 psi.

C. Water Cure. Water cure in accordance with Subsection 551.03.7(A) until the pavement has reached a minimum compressive strength of 2,500 psi.

501.03.9 Handling and Placing Reinforcement

Keep reinforcing steel clean, rust free, straight and distortion free, placed and held in position as specified.

Store reinforcing steel out of the weather, distributing only the steel needed for immediate placing within the work.

Assemble and place reinforcement for bar mats as specified. Maintain bar mat placement during concreting operations.

Tie all intersections. Lap all adjacent ends at least 40 bar diameters.

501.03.10 Joints

Make transverse construction joints as detailed in the contract, at the end of each day's run, or where concrete work is interrupted for more than 1 hour.

A. Sawing Joints. Saw joints in a single cutting operation for a specific joint. Make saw cuts true to line and to the dimensions shown in the contract. Begin joint sawing as soon as the concrete has hardened sufficiently to permit sawing without raveling or moving of aggregate. Saw joints before uncontrolled cracking takes place. Control joints may be sawed by any saw designed for concrete sawing. If necessary, use continuous sawing operations regardless of weather or daylight conditions. Discontinue sawing a joint if a crack develops ahead of the saw.

   A heavy span saw which is supported on the new pavement is not allowed for sawing pavements and concrete overlays less than 7 inches (175 mm) thick. If the pavement has been covered or protected due to cold weather, rain, or snow, saw joints by conventional saw equipment only.

   Saw joints requiring compression sealant materials to be installed so that the compression sealant material can be installed and function correctly.

   Repair uncontrolled cracking or random transverse cracking at no additional cost to the Department. Use repair methods approved by the Project Manager.

B. Expansion Joints. Install preformed joint material perpendicular to the pavement surface. Ensure that the joint material remains in proper position. Set reference stakes or markers showing joint location prior to placing concrete adjacent to the joint. After the mechanical finishing equipment has passed over the joint, check the joint for movement. If movement in excess of ½-inch has occurred, immediately correct the installation to its intended position. After the surface finishing has been completed, edge the joint as shown in the contract documents with minimum disturbance to the adjacent concrete.

C. Sealing Joints. Seal joints as designated in the contract before any portion of the pavement is opened to the traffic, including construction traffic. Saw or prepare joint openings to the designated dimensions. Clean the joint opening and seal with material in accordance with Subsection 501.02.5.

   Within 3 hours after a joint has been wet sawed to the finished dimension, flush the wet sawing residue away from the sawed faces using a high-pressure water blast operating with at least 1000 pounds per square inch. Within 3 hours after the joint has been dry sawed to the finished dimension, blow the dry sawing residue from the joint. Use air compressors that provide moisture and oil free compressed air.

   Immediately prior to installation of sealant, clean joints with an air blast. Do not perform sealing until visual examination verifies the joint surfaces appear dry, and clear of dust and contamination. Prepare joint sealer and install in the joint and to the proper level as shown in the contract and as recommended by the manufacturer. Heat hot poured

sealers in a thermostatically controlled heating kettle. Heat the material to the temperature required for use, but not above that recommended by the manufacturer. After sealing, remove excess sealer from the pavement surface.

Place joint sealer only when the pavement and ambient air temperatures are 40°F (4°C) or above. When near this minimum, additional air blasting or drying time, or both, may be necessary to ensure a satisfactory bond to the joint faces. When this sealer cannot be properly placed due to weather/seasonal limitation, submit a joint construction plan and sealing details to the Project Manager for approval before commencing paving. Delay the cleaning, sealing, and, if required, resawing of joints until the following spring. This delay requires the Engineer's approval.

When surface correction is required, repair seals damaged from the corrective work. Joint preparation, cleaning, and sealing may be delayed until after corrective work, provided the pavement is not opened to traffic before corrective work is performed.

The Project Manager may limit the wheel loads and axle loads of equipment operating on the pavement during preparation, cleaning, and sealing operations, if prior to the age and strength specified in Subsection 501.03.16.

D. Alternative Joint Layout. Submit an alternate plan for longitudinal and transverse joint layout with details that are determined by Contractor sequencing to the Project Manager for approval a minimum of 15 business days before the start of paving work.

Space the transverse joints not less than 10 feet (3 m) and not more than 15 feet (4.5 m). Space longitudinal joints not further than 13 feet (4 m) and as close to lane lines as possible. Skew longitudinal lines along mainline to match lane lines ahead.

Construct transverse joints at a 90° angle to the centerline. Continue transverse joints through the curb. Skew longitudinal and transverse joints to intersect all manholes, boxes, and inlets. The angle of joint intersection or between joints and a free edge must not be less than 60°. Space joint offsets not less than 18 inches (455 mm).

501.03.11 Surface Test

Test pavement surfaces in accordance with the following criteria using the straightedge method.

- Sections less than 300 feet (91.5 m) in length.
- Sections within 50 feet (15.2 m) of existing pavements or bridge ends.
- Sections within 50 feet (15.2 m) of intersections requiring warping to match side streets.
- Sections having horizontal curves with a centerline radius less than 1000 feet (305 m) and the superelevation transitions of those curves.
- Sections having vertical curves with L/A (K-value) less than 100 where L is the length of the curve in feet and A is the grade change in percent (L/A less than 30.5 where L is in meters).

Test all other surfaces in accordance with Subsection 501.03.14(B).

A. Straightedge. Measure surface smoothness of travel lanes not subject to MRI testing with a 10- foot straightedge. Ensure the completed surface of the wearing course does not vary more than 1/8-inch from the lower edge of a 10-foot straightedge placed on the surface parallel to the centerline.

Measure smoothness perpendicular to the centerline with a 10-foot straightedge across all lanes with the same cross slope, including shoulders when composed of cement concrete pavement. Discontinue the overlapping 10-foot straightedge measurement at a point 6 inches (150 mm) from the most extreme outside edge of the finished pavement. Ensure the completed surface of the wearing course does not vary more than ¼-inch from the lower edge of a 10-foot straightedge placed on the surface perpendicular to the centerline. Correct any deviations in excess of the above tolerances.

Where the grinding methods would result in an unsatisfactory surface or in a slab thickness less than specified, the affected pavement may require an adjustment in the contract unit price or removal and replacement in accordance with Subsection 501.03.20.

B. Ride Specification. Pavement surface smoothness for this project includes International Roughness Index (IRI) testing. Perform IRI testing on each through lane, climbing lane, ramp, and passing lane, greater than 0.2 mile in length. These sections will be subject to incentive/disincentive adjustments. Evaluate ride quality using the Mean Roughness Index (MRI) calculated by averaging the IRI data for the left and right wheel path within the section.

Shoulders, tapers, and other areas not included in MRI testing will not be subject to incentive adjustments. All work is subject to parallel and transverse 10-foot straightedge requirements, corrective work and disincentive adjustments.

Operate the inertial profiler in accordance with AASHTO R 57. Collect two longitudinal traces, one in each wheel path. Collect profile data after completion of all concrete paving on the project in a continuous pass including areas excluded from pay adjustments. Provide notice to the Project Manager at least 7 calendar days prior to testing.

Within 30 calendar days after the Contractor's testing, the Department may perform verification testing. If the verification testing shows a difference in MRI greater than the percentages shown in Table 2 of AASHTO R 54 the following resolution process will be followed:

1. The profiles, equipment and procedures will be evaluated to determine the cause of the difference.
2. If the cause of the discrepancy cannot be resolved, coordinate retesting with both profilers at a mutually agreed upon time. The two profilers will test the section within 30 minutes of each other. If the retest shows a difference in MRI equal or greater than the percentages shown in Table 2 of AASHTO R 54 the Engineer's test results will be used to establish pay adjustments.

Evaluate profiles for acceptance, incentive payments, disincentive payments, or corrective action using the current version of ProVAL and provide the results including the profile data in unfiltered electronic Engineering Research Division (ERD) file format to the Project Manager within 2 business days of completing testing each section of pavement. If the profile data files are created using an export option in the manufacturer's software where filter settings can be specified, use the filter settings that were used to create data files for certification.

Analyze the entire profile. Exclude any areas specifically identified in the Contract. Exclude from the analysis the first 50 feet after the start of the paving operations and last 50 feet prior to the end of the paving operation, the first 50 feet (15 m) on either side of bridge structures and bridge approach slab. Report the MRI results in inches per mile for each 52.8-foot (16 m) section and horizontal distance measurements in project stationing to the nearest foot. Include pay adjustments in the results. The Project Manager will verify the analysis.

Corrective work for pavement smoothness may be taken by the Contractor prior to MRI testing. After completion of the MRI testing, measure the smoothness of each 52.8- foot (16 m) section with an MRI greater than 125 inches per mile with a 10-foot straightedge within 14 calendar days or as allowed by the Project Manager. Identify all locations that require corrective work and provide the straight edge measurements at each location that exceeds the allowable limit to the Project Manager. If all measurements in a 52.8-foot (16 m) section comply with smoothness requirements, provide the maximum measurement to the Project Manager and a statement that corrective work is not required. Corrective work is required for pavement identified by the Contractor or Department that does not meet the following requirements:

1. The completed surface is uniform in texture, smooth, uniform as to crown and grade, and free from defects of all kinds.
2. The completed surface does not vary more than ¼ inch from the lower edge of a 10-foot straightedge placed on the surface parallel to the centerline.
3. The completed surface does vary not more than ¼ inch in 10 feet (3 m) from the rate of transverse slope shown in the contract.

Complete all corrective work at no additional expense to the Department, including traffic control. Do not begin corrective work until the concrete has reached design strength. Repair pavement by one or more of the following methods:

1. Diamond grinding; ensure repairs do not reduce pavement thickness by more than ¼ inch less than the thickness shown in the contract. When required by the Project Manager, verify the thickness of the concrete pavement by coring. Thickness reduction due to corrective work will not be included in thickness measurements for calculating the Thickness Deficiency in Subsection 501.03.20.
2. Removal and replacement.
3. By other method allowed by the Project Manager.

Check the repaired area by the Contractor with a 10-foot straightedge to ensure it no longer requires corrective work. With concurrence of the Project Manager an inertial profiler may be used in place of the 10-foot straight edge.

501.03.12 Correcting Spall and Cracks

Remove and replace pavement slabs cracked through the full depth into 3 or more parts.

e air a e ent slabs containing a single diagonal crac intersecting t e trans erse and longit dinal joints wit in of the width and length of the slab from the corner by removing and replacing the smaller portion of the slab. Repair broken slabs as directed.

Groove and seal random cracks that penetrate the full depth of the pavement. Groove the top of the crack to ¾-inch (19 ini de t and a widt between ⅜ to -inch (10-16 mm) using an approved grooving machine. Use a vertical rotary-cutting machine that can follow the crack path and widen the top of the crack to the required section without spalling or damaging the concrete. Remove all loose and fractured concrete, and thoroughly clean and seal the groove with the sealant specified in the contract.

The Project Manager will determine what random cracks are tight, don't penetrate the full depth of the pavement and will be left undisturbed. When requested by the Project Manager, determine the crack depth penetration by drilling and inspecting cores at Contractor expense.

When a transverse random crack terminates in or crosses a transverse contraction joint, fill the un-cracked portion of the joint with epoxy-resin mortar or grout, and route and seal the crack.

When a transverse random crack nearly parallels the planned contraction joint and is within 5 feet (1.5 m) from a contraction joint, route, seal, and fill the crack with epoxy-resin grout or mortar.

When a transverse random crack is more than 5 feet (1.5 m) from the nearest contraction joint in the pavement, seal both the joint and the crack. Thoroughly clean the joints before filling with epoxy-resin mortar or grout.

Repair spalls by making a saw cut at least 1-inch (25 mm) outside the spalled area and to a minimum depth of 2 inches (50 mm). When the spalled area abuts a joint, make a saw-cut 2 inches (50 mm) deep or 1⁄6 the slab thickness, whichever is greater. Chip out the concrete between the saw cut and the joint or primary crack to solid concrete. Thoroughly clean the resulting cavity of all loose material. Apply a prime coat of epoxy-resin binder to the dry, cleaned surface of all cavity sides, except the working joint faces to be retained. Apply the prime coat by scrubbing it into the surface with a stiff bristle brush. Place hydraulic cement concrete or epoxy-resin concrete or mortar immediately following the prime coat application.

For spalled areas abutting working joints or working cracks penetrating full depth, place an insert or other bond breaker to maintain the joint or crack during the patch repair.

501.03.13 Opening to Traffic

Traffic and Contractor's vehicles and equipment are prohibited on the concrete until one of the following test results indicate the concrete has achieved strength. Joint sawing and sealing equipment are allowed with the Project Manager's approval

A. Flex Beam Method. Prepare the concrete flex beams in accordance with MT 101 and test for modulus of rupture using AASHTO T 97.

One test set consists of 3 beams. Take the concrete for the test beams from different concrete batches for each 2,500 square yards (2,100 m2) of concrete pavement and make at least 2 sets per day. Test the beam sets for modulus of rupture. Cure the test beams under the same environmental conditions as the pavement they represent.

The pavement, represented by the beams, may be opened to traffic when the average modulus of rupture of the set exceeds 350 psi (2,415 kPa) and no individual beam's modulus of rupture is less than 300 psi (2,070 kPa).

The Contractor may select the time for testing the beams. Test the flex beams on or near the project, using Contractor furnished equipment and with a Department Inspector witnessing the tests.

Include all costs to make, cure and test the flex beams in the contract unit price for PCCP.

B. Maturity Meter Method. Prepare concrete flex beams or compressive test cylinders to validate the maturity meter performance curves. Furnish the Project Manager the maturity-strength relationship and maturity curves along with supporting data for verification. Maturity-strength relationship must indicate compressive strengths of 2500 psi or greater. Develop the maturity meter index curves before construction has commenced.

Determine the time for testing flex beams. Furnish suitable testing equipment.

The pavement may be opened to traffic and construction equipment, with Project Manager's approval, when the maturity meter readings reflect target values have been met.

Furnish all equipment, including maturity meter, thermocouples, wire, and a qualified technician to monitor the maturity meter system.

C. Concrete Test Cylinder Method. Prepare concrete test cylinders according to MT 101 and AASHTO R 60, and test for compressive strength according to AASHTO T 22.

Make a minimum of one set of three compressive test cylinders, sampled from random locations, for each 2,500 square yards (square meters) of concrete pavement but not less than two sets per day. Test compressive test cylinders in sets of three for compressive strength. Cure test cylinders under the same conditions as the pavement they represent.

The pavement may be opened to traffic and construction equipment, with Project Manager's approval, when the average compressive strength of a set of test cylinders is 2500 psi (17,237 kPa) or greater with no single test less than 2,000 psi (13,790 kPa).

Determine the time for testing cylinders. Furnish suitable equipment and test compressive cylinders on or near the project.

Opening to traffic does not constitute a final acceptance of the pavement. The pavement is accepted upon confirmation of the 28-day flexural strength. Repair all concrete damaged prior to the final acceptance at Contractor expense.

501.03.14 Integral Curb

Construct the curb monolithically with the pavement.

Construct the inside face of the curb true to the lines and grades in the contract using the finish specified for the concrete pavement, including longitudinal floating and burlap drag finishing.

Test the surface for longitudinal trueness with a straightedge while the concrete is still plastic. Meet the same surface requirements specified for the concrete pavement.

Continue concrete pavement joints through the integral curb at the same locations, of the same type, and constructed in the same manner.

Cure the integral curb as specified for concrete pavement.

501.03.15 Weather and Night Limitations

Place concrete at night only with the Project Manager's written approval.

Stop concrete work when the ambient temperature falls below 40 °F (4 °C) and do not resume until the ambient air temperature reaches 35 °F (2 °C) and is rising.

Do not place concrete on a frozen foundation course or subgrade.

Remove and replace all concrete damaged by frost at Contractor expense.

501.03.16 Protection of Concrete

Cover the concrete with an approved commercial insulating blanket, covering all pavement if the ambient temperature falls below 35 °F (2 °C) during the cure period. Leave in place for 7 days.

The Project Manager may direct the leaving the blanketing in place beyond the 7-day curing period.

501.03.17 Pavement Thickness

Construct concrete pavement to the specified thickness. Pavement not meeting the required thickness will be subject to replacement in accordance with Subsection 501.03.20(B) or to the price adjustments according to Table 501-2. Tolerances allowed for subgrade or base course construction do not modify the thickness requirements.

A primary unit of pavement is the pavement area placed in each day's paving operations. Within each primary unit there may be several secondary units as specified in 501.03.20(B)(2).

A. Thickness Verification.

1. Survey Method. Thickness measurement locations will be determined by random sampling in accordance with MT 606. A minimum of 10 random locations will be tested for each 12,000 square feet (1,115 m^2) of pavement placed within the primary unit. Elevations will be recorded to the nearest 0.01-foot (3 mm). Measurements will be taken as follows:

   The locations will be selected on the finished surface before paving and at the same location on the finished concrete surface.

   The thickness variation will be determined by subtracting the planned thickness from the constructed thickness at each surveyed location. Variations exceeding the planned thickness will be considered as a 0.00 feet (0.0 mm) deviation in the average. The average of the measurements will represent the variation for that primary unit.

2. Coring Method. The Project Manager reserves the right to verify the thickness or resolve discrepancies by coring using AASHTO T 148, recording that measurement to the nearest 0.01-foot (3 mm). Fill core holes with concrete of the same quality as used for the pavement at no cost to the Department.

B. Thickness Deficiency.

1. Variation less than or equal to 0.07-foot (21 mm). If the thickness variation in a primary unit is less than 0.07-foot (21 mm), a deduction will be applied in the amount determined in Table 501-2 times the area of pavement in the primary unit. No incentive or contract adjustment will be allowed for constructed thicknesses exceeding the planned thickness.

TABLE 501-1
CONCRETE PAVEMENT THICKNESS DEFICIENCY

Pavement Greater Than 5 inches (127 mm)		
Average Thickness Deficiency		Price Deduction (%)
Feet	mm	
0.02	6	0
0.03	9	20
0.04	12	32
0.06	18	43
0.07	21	50

Average thickness deficiencies greater than 0.02-foot (6 mm) are rounded to the nearest 0.01-foot (3 mm) and the deficiency adjustment made using Table 501-1.

2. Variation greater than 0.07-foot (21 mm). For each section in a primary unit with a thickness variation greater than 0.07-foot (21 mm), the Project Manager will determine the dimensions of the secondary unit area. The secondary unit is made up of entire panels only. Panels are the areas bound by longitudinal and transverse joints and pavement edges.

C. Acceptance. The Project Manager will randomly measure the thickness in each panel adjacent to the panel(s) in the primary unit which exceeded 0.07-foot (21 mm), by either the survey method or AASHTO T 148. Measurements are taken in each panel until the panels which exceed 0.07-foot (21 mm) are isolated. The Project Manager will determine which panel(s) will require replacement and which may remain in place when the limits of the secondary unit have been defined. Acceptance will be in accordance with procedures (a) or (b) below:

1. Remove and replace the deficient panels at Contractor expense with new concrete. If the area to be removed is not bounded by longitudinal or transverse joints, saw the weakened plane joints at Contractor expense at the locations designated by the Project Manager. Lower the subgrade or base to meet the full thickness requirements. Replaced pavement will be tested for thickness requirements using additional secondary measurements and is subject to all of the contract requirements.
2. The Contractor may leave deficient pavement panels in place if the panels meet all of the other contract requirements. A deduct equal to 50% of the contract unit price per square yard (m^2) will be imposed for those pavement panels left in place. The Department may deduct that amount from any monies due or that may become due the Contractor in accordance with the contract. The decision to leave a deficient panel in place will be by contract modification in accordance with Subsection 105.03.

The cost of all secondary thickness measurements made under this subsection will be deducted from any monies due or that may become due the Contractor in accordance with the contract.

After isolating the secondary unit area(s) from consideration, the average thickness deficiency of the remainder of the primary unit areas will be determined in accordance with Subsection 501.03.20(B)(2). Secondary measurements made outside of a secondary unit area will be used to determine an average in the remaining primary unit area in which the measurements are taken.

No contract adjustment will be allowed for meeting these requirements.

501.03.21 Accelerated Paving Techniques

Submit a request with details for any proposed accelerated paving techniques to the Project Manager a minimum of 7 calendar days before use. Accelerated paving techniques may include but are not limited to; admixtures, cement, alternative curing methods, sawing methods, and joint sealing.

501.04 METHOD OF MEASUREMENT

Furnishing and installing all tie bars, dowels, setting and maintaining wire control lines, sawing longitudinal and transverse joints, sealant, reinforcing steel, accelerated paving techniques, and testing for opening to traffic is not measured for payment. Include all costs in the unit price of PCCP.

501.04.1 Area Measurement

PCCP is measured by the square yard (m^2).

The measured width is from outside to outside of completed pavement including integral curb, not exceeding the specified width or the width ordered by the Project Manager.

The length is measured along the centerline of the pavement surface.

Fillets for widened sections or at drainage structures and similar locations placed monolithic with the pavement are measured as pavement.

Areas constructed other than as pavement are deducted from the pavement area. No deduction is made for any fixture located within the pavement limits that has a surface area in the plane of the pavement surface of 1 square yard (0.80 m^2) or less.

Integral curb included in the completed pavement is not measured separately for payment.

501.05 BASIS OF PAYMENT

Payment for the completed and accepted quantities is made under the following:

Pay Item	Pay Unit
Cement Concrete Pavement	Square Yard (m^2)

Payment at the contract unit price is full compensation for resources necessary to complete the item of work in accordance with the contract.

551 HYDRAULIC CEMENT CONCRETE Page 225 4-25-19

Rescind Section 551 and replace with the following:

SECTION 551
HYDRAULIC CEMENT CONCRETE

551.01 DESCRIPTION

These are the general requirements for designing hydraulic cement concrete mixtures, the ingredients, mixing, transporting, placing, curing, testing and acceptance for all classes and uses of hydraulic cement concrete.

551.02 MATERIALS

Provide cementitious materials and admixtures from sources listed on the QPL.

551.02.1 Cement

Furnish low-alkali hydraulic cements meeting the following requirements as specified in the contract. Use cements meeting A or B unless otherwise specified.

A. Furnish low-alkali portland cement in accordance with AASHTO M 85, Type I, II, III, or V.
B. Furnish low-alkali hydraulic blended cement in accordance with AASHTO M 240, Type IL, IP,IS or IT. When fly ash or ground granulated blast furnace slag (GGBFS) is used in blended cement, limit the replacement amount to the maximums specified in Subsection 551.03.2(A)(5).
C. Furnish low-alkali hydraulic cement in accordance with ASTM C1157, Type GU, HE, MS, HS, MH, or LH.

Meet the following requirements for all types of cement:

1. The total alkali content does not exceed 0.6%, calculated as the percentage of sodium oxide (NaO) plus 0.658 times the percentage of potassium oxide (K_2O).
2. Use only 1 brand of any 1 type of cement on the contract except by written approval from the Project Manager. Different brands or grades, if approved, cannot be used alternately in any 1 placement.
3. Do not use air-entraining cements.

551.02.2 Fly Ash

When included in the mix design, furnish fly ash in accordance AASHTO M 295, Class C or F, including optional chemical requirements as set forth in Table 2.

551.02.3 Ground Granulated Blast Furnace Slag (GGBFS)

When included in the mix design, furnish GGBFS in accordance with AASHTO M 302, Grade 100 or Grade 120.

551.02.4 Microsilica Fume (Silica Fume)

When included in the mix design, furnish microsilica in accordance with AASHTO M 307.

551.02.5 Admixtures

When included in the mix design, furnish admixtures in accordance with AASHTO M 194. Ensure that the total contribution of chloride ions from all admixtures and air-entraining agents does not exceed 50 parts per million chloride ions (Cl-) by weight of cementitious material. All admixtures must be compatible with other constituents including cement, silica fume, GGBFS, fly ash, and other admixtures. Dose all chemical admixtures according to manufacturer’s recommendations unless trial batches provide adequate information for different dosage rates.

551.02.6 Air-entraining Agents

Include an air-entraining agent in the mix design unless otherwise specified. Furnish an air-entraining agent in accordance with AASHTO M 154.

551.02.7 Water

Furnish water for mixing and curing concrete in accordance with 713.01.

551.02.8 Aggregate

Furnish aggregates in accordance with Subsection 701.01.

551.02.9 Storage of Materials

A. Cementitious Materials. Store all bulk cementitious materials in metal silos, bins, or other approved storage. Provide storage facilities that permit convenient sampling and inspection. Store all sacked cementitious materials in weatherproof buildings or, if approved, in the open on raised platforms with waterproof covering. Partially set, caked or lumpy cementitious material will be rejected.

B. Aggregates. Store aggregates in compartmented bins, or other methods that separate the different aggregate sizes to prevent contamination and segregation. Suspend work until aggregate contamination or segregation is corrected.

Build up aggregate stockpiles in a manner that avoids contamination and segregation. Re-mix segregated aggregate to the grading requirements at Contractor expense.

When ready-mixed concrete is furnished, the ready-mix producer's stockpiled aggregates must meet all aggregate specifications. Establish separate stockpiles for Department work if existing stockpiles do not meet specifications.

Do not use contaminated or segregated aggregate removed from stockpiles in the work.

Handle all aggregates to prevent segregation and to obtain uniformity of materials. Pile separated aggregates and aggregates secured from different sources in separate stockpiles. Provide sites which are level, firm and free of all foreign materials for the stockpiles. If aggregates are placed directly on the ground, do not use material within 6 inches (150 mm) of the ground level. Leave this material undisturbed to avoid contaminating the aggregate being used with the foreign material.

551.03 CONSTRUCTION REQUIREMENTS

551.03.1 Classification

Design and produce concrete using the classifications defined in Table 551-2.

TABLE 551-2
CONCRETE CLASSIFICATION

Class	Use
General	General use concrete. Used for sidewalks, curbs, and slope protectors. Also used in precast products.
Structure	Used for structural concrete. (Use for all sub-structural work.)
Deck	Used for all superstructure concrete, deck slabs and barriers.
Overlay	Used on bridge deck overlays.
Pave	Used for concrete pavement, streets and highways.
PRE	Used in all prestressed items.
Controlled Low Strength Material (CLSM)	Used for bedding, encasement, and general backfill. (flowable fill, density fill, flowable mortar, slurry cement backfill.)
Drilled Shaft	Used for drilled shafts.
SCC	(Self-consolidating concrete) Used for precast, drilled shafts, and aesthetic structural components.
Lean	Used for setting metal fence posts and braces and similar uses where high quality concrete is not necessary.

551.03.2 Composition of Concrete

Design and produce concrete in accordance with Table 551-3.

TABLE 551-3
CONCRETE REQUIREMENTS

Class	Nominal Maximum Aggregate Size inches (mm) [6 & 9]	Cementitious Materials Content, lbs./yd^3 (kg/m^3) [11]	Indicated Compressive Strength, 7-Day, PSI (MPa)	Minimum Required Compressive Strength, 28-Day, PSI (MPa) [5]	Water / Cement Ratio (W/C) [5]	Maximum Target Value for Slump, inches (mm) [2]	Slump Tolerance, inches (mm)	Required Air Content, (%) [7]
General[8]	1½ (37.5) - ¾ (19)	658 (390) max	—	4000 (28)	0.45 max	5 (130)	+1½ (37) to - 2 (50)	5.0-8.5
Pave	1½ (37.5) - ¾ (19)		Note 3			3 (75)		
Pre[1]	¾ (19)	—	—	Note 1	0.40 max	—	—	—
SCC	¾ (19)	—	—	Note 4	0.42 max	See Special Requirements for SCC Concrete		5.0-8.5
Deck	1½ (37.5) - ¾ (19)	564 (334) max	—	4000 (28)	0.42 – 0.45	5 (130)	+1½ (37) to - 2 (50)	
Overlay-SF	½ (12.5)	580 (344) max	Note 10			5 (130)		
Overlay-LM	½ (12.5)	660 (392) min	Note 10		0.30 - 0.40	5 (130)		3.0-6.5
Structure	1½ (37.5) - ¾ (19)	580 (344) max	—		0.42 max	6 (150)		5.0-8.5
Drilled Shaft	¾ (19)	—	—		0.45 max	See Special Requirements for Drilled Shaft Concrete		—
Lean	1½ (37.5) - ¾ (19)	—	—	—	0.53 max	—		Note 12

Notes:

1. The strength for transfer of pre-stress and the 28-day strength requirement vary with beam length and design. Check plans and specifications for each project.
2. The designed target value for slump may be changed, within requirements, when necessary to facilitate proper placement.
3. For full-depth concrete pavement, the flexural strength requirement to open to traffic is 350 psi (3.5 MPa) minimum determined by AASHTO T 97 or 3500 psi (24 MPa) compressive strength.
4. For self-consolidating concrete, the 28-day strength may vary with the class of concrete specified. Check plans and specifications for each project.
5. Maximum water cement ratios and minimum 28-day design strength requirements do not relieve the contractor of supplying concrete producing adequate freeze-thaw protection.
6. Mix designs with other nominal maximum aggregate sizes may be requested based on certain placement and design scenarios.
7. If 1½-inch (37.5 mm) nominal maximum aggregate is used in the design, the air content requirement is reduced to 4.0% - 7.5%.
8. When class General is specified for seal concrete, air entrainment is not required.
9. Nominal Maximum aggregate size is defined as one sieve size larger than the first size to retain more than 10%.
10. Compressive strength must reach a minimum of 3,000 psi (21 MPa) before opening to traffic.
11. When high-early strength concrete is required by contract, higher cement contents may be submitted with the mix design for approval.
12. The minimum required air content is 3%. Tests will be conducted as required by the Project Manager.

Furnish the names of proposed suppliers and locations of proposed aggregate sources upon notice of award. New sources must be sampled, tested, and approved.

Coordinate with the Project Manager for submitting samples for testing.

A. Design. Design the concrete mix as follows:
   1. Submit a concrete mix design for each class of concrete to be used on a project. Meet all the requirements of MT 100.
   2. Design the concrete mix to meet Table 551-3 requirements or the requirements stated below for specific classes of concrete. State the design proportions in terms of aggregates in a saturated, surface dry condition. Submit the proposed aggregate source and proportion computations. Submit a final mix design for approval at least 15 business days before intended use on form MDT-MAT-008.
   3. Furnish materials meeting the requirements of Subsection 551.02.
   4. Submit a new design when proposing any change in material sources.
   5. The following supplementary cementitious materials (SCMs) may be used as partial replacement for hydraulic cement in the mix design.
      a. Fly ash may be included in the mix design for up to 30% by weight of the total cementitious material. Combinations of various classes of fly ash may not exceed 30% by weight of the total cementitious material.
      b. Microsilica Fume may be included in the mix design for up to 5% by weight of the total cementitious material when a minimum of 15% fly ash or GGBFS is also included in the mix design or when the mix design incorporates acceptable blended cement.
      c. Metakaolin may be included in the mix design for up to 20% by weight of the total cementitious material.
      d. Ground granulated blast furnace slag may be included in the mix design for up to 50% by weight of the total cementitious material.

      When multiple SCMs are used in a design, the total replacement rate may not exceed 50% by weight of the total cementitious material.

      Calculate the W/C ratio as the total weight of water divided by the total weight of cementitious material.
   6. Blended cements in accordance with Subsection 551.02 may be used in the mix design.
   7. When Type V cement is specified for sulfate resistance, other cementitious material mixtures tested in accordance with ASTM C1012 may be submitted for approval. Acceptance will be based on expansion less than 0.10% at 18 months.
   8. The mix design may include provisions that address special conditions of the project that would otherwise not be allowed. The following provisions may be included in the mix design:
      a. Delayed Initial Set. The mix may be designed for delayed set time to allow for long haul or other project conditions. When delayed set is included in the mix design, the time requirements for placing the concrete in final position in accordance with Subsection 551.03.4 may be replaced by time to final placement requirements included in the mix design. Include in the mix design information on the delayed set provisions of the design and specific time to final placement requirements. Support the time to final placement with test results from trial batches.
      b. Delayed Strength and Permeability Testing. The mix design may include cementitious materials or other admixtures that result in slow strength gain or permeability reduction. When included in the mix design, testing at 56 days may be requested. Support this request with test results from trial batches. Upon acceptance, 56 day results will be used in all provisions that refer to 28-day strength, and permeability will be accepted in accordance with table 551-8.

B. Class Pave. Design and produce class Pave concrete in accordance with Table 551-3 and include in the mix design flexural strength results of at least 500 psi (3.5 MPa) in accordance with AASHTO T 97.

C. Class Deck and Overlay-SF. Design and produce class Deck and Overlay-SF concrete in accordance with Table 551-3 and the following:
   - Use 3%-5% silica fume. Include fly ash and/or GGBFS as SCMs.
   - SCMs replacement quantities must meet the requirements of Subsection 551.03.2(A)(5).
   - Do not use incompatible air entraining, water reducing and/or super-plasticizing admixtures.
   - Mix requires trial batch surface resistivity test results in accordance with AASHTO T 358 greater than 15 kilohm-centimeters at 28 days or 21 kilohm-centimeters at 56 days. Rapid chloride permeability test results in accordance with AASHTO T 277 less than 3300 coulombs at 28 days or 2000 coulombs at 56 days will also be accepted.
   - Submit a batching sequence procedure with the mix design including the amount of material charged and the time before the next material will be added. Include approximate mixer revolutions for each stage of the sequence.
   - The target strength to be used for incentive calculations is the 28/56-day strength submitted with the mix design. If the mix design strength is greater than 5500psi, the target will equal 5500psi.

- When barrier rail is cast with Class Deck concrete, the lower range for the W/C ratio may be reduced to 0.38. Submit the request for approval with the mix design.
-

Alternative mix designs not in accordance with Table 551-3 may be accepted provided the following requirements are met:

1. Include in the design compressive strength test results according to AASHTO T 22 for 3, 7, and 28 days. The design must produce strengths in accordance with Table 551-3 by the specified age.
2. Include in the mix design shrinkage test results according to AASHTO T 160. The maximum allowed shrinkage for mix design acceptance is .0300% at 28 days.
3. Include in the mix surface resistivity test results in accordance with AASHTO T 358 greater than 15 kilohm-centimeters at 28 days.
4. Include in the mix design creep test results at 28 days according to ASTM C512.
5. Include in the mix design modulus of elasticity (MOE) results according to ASTM C469.
6. Include in the mix design air-void spacing results according to ASTM C457 modified point-count method at 100x magnification. The average of all tests must not exceed 0.009 inches (0.230 mm) with no single test greater than 0.010 inches (0.260 mm). The total air content must exceed 5.5%.
7. Design and produce concrete maintaining a plastic air content of 5.5% - 8.5%.
8. Submit a batching sequence procedure with the mix design including the amount of material charged and the time before the next material will be added. Include approximate mixer revolutions for each stage of the sequence.
9. The target strength to be used for incentive calculations is the 28/56-day strength submitted with the mix design. If the mix design strength is greater than 5500psi, the target will equal 5500psi.

D. Class Drilled Shaft. Drilled shaft concrete is a highly workable concrete that can flow through dense reinforcement and adequately fill voids without segregation or excessive bleeding without the need for vibration. Drilled shaft concrete should not begin initial set until the placement is complete. Design and produce Class Drilled Shaft concrete in accordance with Table 551-3 and the following:
   1. Set a target slump that meets the needs of the project. Set the target slump no lower than 8 inches (200 mm). Do not place drilled shaft concrete having a slump of less than 7 inches (175 mm).
   2. Include with the mix design an estimate of the maximum time from producing the 1st batch of concrete for a shaft to the anticipated completion of that shaft. All concrete used for the drilled shaft must maintain a minimum of a 6-inch (150 mm) slump until 2 hours after the estimated completion.
   3. Air entrainment may be used in drilled shaft concrete if needed to reduce bleed water or achieve certain placement properties
   4. Self-consolidating concrete may be used for drilled shaft mix designs. When used, meet the above requirements and those of Subsection 551.03.2(F).

E. Latex-Modified Overlay Concrete (Overlay-LM). Design and produce overlay-LM concrete in accordance with the following requirements:
   1. Use only Type I or Type II hydraulic cement.
   2. Furnish concrete with a latex emulsion admixture rate of 25 gallons per cubic yard (123.8 L/m^3). Use a latex admixture containing a polymer of 66% ± 5% styrene and 34% ± 5% butadiene, with the polymer comprising between 46% and 49% of the total emulsion. The emulsion must have a sodium alkyl sulfate stabilizer acting as an anionic surfactant, polymer average particle size between 1,900 and 2,500 angstroms, a weight of 8.43 to 8.52 pounds per gallon (1.01 - 1.02 kg/L) at 75 °F (24 °C), and a pH between 9.5 and 11.0.
   3. Protect the latex admixture from temperatures below 32 °F (0 °C) and above 85 °F (29 °C) at all times. Provide a thermometer capable of storing minimum and maximum temperatures and place it with any admixture stored on site. Replace admixture subjected to temperatures outside the range above at no expense to the Department.

F. Controlled Low Strength Material (CLSM). CLSM is a mixture of hydraulic cement, SCMs, aggregate, natural sands, silty sands, air entraining admixture and water. CLSM contains a low cementitious content for reduced strength development. Submit a mix design for approval including aggregate gradations, cement and SCM mill certifications, proportioning, and trial batch information.
   1. Excavatable. Design and produce excavatable CLSM in accordance with the following requirements:
      a. Unconfined compressive strength between 35 psi and 150 psi (0.24 - 1 MPa) determined by ASTM D4832.
      b. Air content between 5% and 40% determined by ASTM D6023.
      c. Unit weight of 80 – 110 lbs/ft^3 (1,280 – 1,760 kg/m^3) determined by ASTM D6023.
      d. Consistent flow producing a self-leveling product free of segregation determined by ASTM D6103
      e. Do not use coarse aggregate in exca atable axi ⅜-inch (9.5 mm) nominal maximum aggregate size designs.)
   2. Non-Excavatable. Design and produce non-excavatable CLSM in accordance with the following requirements:
      a. Unconfined compressive strength greater than 150 psi (1 MPa) determined by ASTM D4832

b. Air content between 5% and 30% determined by ASTM D6023.
c. Unit weight of 100-130 lbs/ft^3 (1,600 – 2,080 kg/m^3) determined by ASTM D6023.
d. Consistent flow producing a self-leveling product free of segregation determined by ASTM D6103.

Do not use materials in CLSM with a plasticity index over 4 according to AASHTO T 89 and AASHTO T90.

Furnish aggregates in accordance with Table 551-4 or Table 701-2.

TABLE 551-4
CLSM GRADATIONS

Percentage By Weight Passing Square Mesh Sieves	
Sieve Size	Percent Passing
¾-inch (19 mm)	100
No. 4 (4.75 mm)	65 - 100
No. 30 (0.600 mm)	40 - 80
No. 200 (0.075 mm)	0 - 30

High air generators or foaming agents may be used in lieu of conventional air entraining admixtures and may be added at the jobsite and mixed in accordance with the manufacturer's recommendation. The requirements for percent air and unit weight are for laboratory mix designs only and are not intended for jobsite acceptance requirements.

Produce a consistent mix that results in a flowable product at the time of placement which does not require manual means to move it into place.

Secure tanks, pipes and other members to be encased in CLSM to prevent displacement during placement.

Protect CLSM from traffic until sufficient strength has been achieved for further construction operations.

The CLSM may be mixed onsite, or at a ready-mix plant and transported to the site. Keep the mix homogeneous and in a suspended condition to prevent settling of the materials prior to placement. Characteristics of CLSM include, consistency, workability, and plasticity such that the material is flowable, self-compacting and self-consolidating during placement.

G. Self- Consolidating Concrete (SCC). SCC is a highly workable concrete that can flow through densely reinforced or complex structural elements under its own weight and adequately fill voids without segregation or excessive bleeding without the need for vibration.

SCC may be used for Classes General (in precast or aesthetic placements only), Structure, and Drilled Shaft concrete. Design and produce SCC in accordance with Table 551-3 and the following:

1. 28 day compressive strength meeting the requirements of the class of concrete specified or established in the contract (e.g. Class Drilled Shaft = 4000 psi (28 MPa)). Many precast designs requiring Class General concrete have varying design strengths.
2. Provide a slump-flow within ± 2 inches (± 50 mm) of the target value. Set target within the range of 20 to 26 inches (450 to 710 mm). Test in accordance with AASHTO T 347. When used for a drilled shaft design, include in the design, hourly slump-flow retention testing up to the desired placement time of the shaft.
3. Provide a maximum visual stability index (VSI) of 1 in accordance with AASHTO T 351.
4. Provide a maximum J-ring value of 2 inches (50 mm) in accordance with AASHTO T 345. When used for a drilled shaft, include in the design, hourly J-ring testing up to the desired placement time of the shaft.

Include the above test results in the mix design submittal. If SCC is used in the production of precast items, meet the testing requirements in Subsection 554.03.6.

H. Class Structure Concrete. Design and produce Class Structure concrete in accordance with Table 551-3.

Alternative mix designs not in accordance with Table 551-3 may be accepted provided the following requirements are met.

1. Include in the design compressive strength test results according to AASHTO T 22 for 3, 7, and 28 days. The 28-day results must exceed specified strength.
2. Include in the mix design shrinkage test results according to AASHTO T 160. The maximum allowed shrinkage for mix design acceptance is .0350% at 28 days.
3. Include in the mix design creep test results at 28 days according to ASTM C512.
4. Include in the mix design MOE results according to ASTM C469.
5. Include in the mix design air-void spacing results according to ASTM C457 modified point-count method at 100x magnification. The average of all tests must not exceed 0.009-inc 23 wit no single test greater t an 0.010-inc 2 e total air content must exceed 5.5%.
6. Design and produce concrete maintaining a plastic air content of 5.5% - 8.5%.

I. Class Pre Concrete. Design and produce Class Pre concrete in accordance with Table 551-3. Alternative mix designs not in accordance with Table 551-3 may be accepted provided the following requirements are met.

1. Include in the design compressive strength test results according to AASHTO T 22 for 3, 7, and 28 days. Also include strength tests at intended de-tensioning/release times (e.g. 12 hrs, 16 hrs, 24 hrs, etc.) The 28-day results must exceed specified strength.

2. Include in the mix design shrinkage test results according to AASHTO T 160.
3. Include in the mix design creep test results at 28 days according to ASTM C512.
4. Include in the mix design MOE results according to ASTM C469.

J. Prepackaged Concrete. Prepackaged concrete or rapid set patching material must contain a product data sheet proving the product meets the specifications required for its intended use. Prepackaged concrete is subject to Project Manager approval.

K. Lean Concrete. Design and produce Class Lean concrete in accordance with Table 551-3. Submit material proportioning to the Project Manager for acceptance. A mix design in accordance with MT 100 is not required for Class Lean concrete.

551.03.3 Batching, Mixing, Handling and Sampling

Produce each class of specified concrete from approved material batched in the proportions specified in the approved mix design.

Correct for moisture content variations. All concrete aggregates are sampled using methods described in MT 201 using sample sizes used in MT 202. MT 122 will be used to calculate combined gradations.

The water may be proportioned by weight or volume. Proportion the cement and aggregates by weight.

The temperature of the combined material must be less than 130 °F (54 °C) before the addition of cementitious materials.

Meet the requirements of ASTM C94 for all concrete batch plants and operations prior to and throughout production of concrete for any work, including concrete for any field trial batches. In addition to ASTM C94, meet the following requirements throughout the production of concrete:

A. Quality Control. When requested, furnish documentation for all the plant's equipment including each plants quality control procedures, calibration records, maintenance records, and any other information pertinent to proper concrete production. All measuring devices, batching equipment, trucks, and mixers are subject to approval.

B. Water.
1. Weigh Measurement. Ensure the weigh equipment measurements are not effected by pressure variations in the water supply lines. The Project Manager may require an auxiliary tank for filling the weighing tank.
2. Metering. Measure water volume by metering through a recording water-meter device, accurate to within plus or minus 1.0% of the required volume or plus or minus 1 gallon (3.8 L), whichever is less.

Completely discharge wash water from the mixer before starting any batching operation.

C. Cementitious Materials.
1. Proportion cementitious materials by weight on all projects for all classes of concrete.
2. Ensure equipment for weighing cementitious material is accurate to within 0.5% of the true weight.
3. Weigh cementitious material to within 1.0% of the batch target weight.
4. Weigh each cementitious material separately.

D. Admixtures. If using 2 or more admixtures in a single concrete batch, add each admixture separately to prevent interaction of the different admixtures before mixing with other batch materials. Agitate admixtures to ensure homogeneous concentrations in accordance with the manufacturer's recommendations.

If using a mechanical dispenser for proportioning admixtures, provide a site gauge or meter. Ensure unobstructed flow and accurate dosing of admixtures.

Batch admixtures in accordance with ASTM C94.

E. Aggregate. Proportion aggregate by weight on all projects for all classes of concrete.

Ensure equipment for weighing aggregates is accurate to within 0.5% of the true weight.

Weigh each aggregates to within 2% of the batch target weight.

Weigh each size of aggregate separately.

F. Batch Ticket. Furnish the Project Manager a printed record of each batch in accordance with ASTM C94. Include on the ticket any water or admixture added after the record is printed and the initials of the person making the additions. Approval is required before any addition to the mix after batching and initial mixing has been completed.

G. Mixers. Use mixers that combine cementitious materials, aggregates, water, and admixtures within the specified time to form a uniformly mixed mass.

Meet the requirements of ASTM C94.

Operate mixers following the manufacturer's recommendations.

The Department may require uniformity testing. When required, meet the requirements of Subsection 106.04.

Do not place concrete improperly or inadequately mixed in the work. If incorporated, remove the concrete at no cost to the Department.

Do not mix, transport, or place concrete using equipment with aluminum or aluminum parts that contact the concrete.

Produce concrete in such quantity and at such a rate as proper placement and finishing will permit. Do not re-temper partially set concrete.

Do not use mixed concrete that has remained in the truck mixer drum longer than 10 minutes without agitation.

When silica fume is incorporated in the mix design, the maximum mixer revolutions will be waived. Ensure a minimum of 50 revolutions at mixing speed when the concrete is in a low-slump stage [2 to 3 inches (50 to 75 mm)] to properly disperse silica fume particles.

H. Job-Site Additions. On-site addition of air entraining or high range water reducing admixtures is permitted up to 2 times. Do not re-dose with other admixtures without the approval of the Project Manager. On-site dosing of water or admixture in no way relieves the contractor of producing passing plastic and hardened concrete test results.

1. Water. Do not exceed the approved W/C ratio.

The addition of water is allowed only 1 time and a minimum of 30 revolutions at mixing speed are required before discharge of concrete.

Do not add water if part of the batch has been discharged as a W/C ratio cannot be determined.

Do not add water if the slump is within specified range.

2. Admixture. Do not exceed manufacturer's recommended dosage rates unless otherwise approved in the mix design stage.

Only admixtures included in the approved mix design may be dosed on-site. A minimum of 30 revolutions at mixing speed are required before discharge of concrete.

Do not add admixtures if any concrete has been discharged from the mixer other than the minimal amount for initial testing.

When the measured plastic air content or slump exceeds the upper test limit and there is time available within the discharge time limit specified, rotate the load at agitation speed and re-test the air content and/or slump. Do not use additives to reduce the air content and/or slump.

No other materials may be added to the concrete mixture.

551.03.4 Transporting Concrete

Ensure that the capacity of the plant and transportation equipment provides a delivery rate to permit handling, placing, and finishing of the work.

Time the delivery of loads to prevent the in-place concrete from taking initial set before succeeding layers or lifts are placed. Do not permit any layer or lift of concrete to remain exposed in excess of 20 minutes before being covered by fresh concrete.

Document the method and time of delivery by batch tickets issued to the driver and signed by the Inspector at the plant if present. Deliver the ticket to the Inspector upon arriving at the project.

Meet the requirements of ASTM C94 and the following:

A. Revolving Drum Mixers. Discharge the concrete at the job and place it in final position within 1½ hours after introducing the mixing water and cement. If long hauls or other project conditions are expected, meet the requirements of Subsection 551.03.2(A)(8)(a).

When the ambient temperature is 85 °F (29 °C) or above, place the concrete in final position within 1 hour after the water and cement are introduced.

B. Non-agitating Transportation Equipment. Do not use non-agitating transport equipment to transport concrete except when placing concrete pavement in accordance with Section 501.

551.03.5 Placing Concrete

Place concrete in accordance with Sections 501, 552, and 553.

Place Class Deck concrete, and Class Structure concrete if used within bridge decks, with a temperature between 50 and 80 °F (10 and 26 °C). Place all other classes of concrete with a temperature between 50 and 85 °F (10 and 29 °C).

Always place concrete as near as possible to its final position.

Do not place concrete that has taken initial set.

Do not place concrete:

1. On frozen or ice-coated ground or subgrade;
2. Against or on ice-coated forms, reinforcing steel, structural steel, conduits, precast members, or construction joints;
3. Under rainy conditions; stop the placement of concrete before the quantity of surface water is sufficient to effect or damage surface mortar quality, cause a flow, or wash the concrete surface;
4. In any foundation until the Project Manager has approved its depth and character;
5. In any form until the Project Manager has approved it and the placement of any reinforcing in it; or
6. In any work area when vibrations from nearby work may harm the concrete's initial set or strength.

Ensure all reinforcement and other embedded items are clean and free from dried mortar, rust, scale, oil, or foreign matter before placing concrete.

Remove all sawdust, chips, other construction debris and extraneous matter from the interior of forms before placing concrete.

Treat the forms interior surfaces to prevent mortar adhesion.

Moisten all foundations, forms, and contacting concrete surfaces with water just before the concrete is placed. Remove any standing water on surfaces which will contact with the concrete.

Provide a method of concrete placement that has a consistent, minimal impact on the concrete properties. All equipment proposed for use in mixing, conveying, placing and compacting the concrete is subject to Project Manager approval prior to its use. All the necessary equipment for any particular placement must be on site and proven to be in working condition before the placement commences. Ensure the equipment is well maintained, suitable in kind and adequate in capacity for the work.

Support bars to maintain their position as shown in the contract.

Place and secure all reinforcing, dowels, and other embedded items as specified.

Deposit concrete in small quantities at many points and then work or run it along the forms. Carefully fill each part of the forms, depositing the concrete as close as possible to its final position, working the coarse aggregates back from the face and forcing the concrete under and around the reinforcing bars.

Deposit concrete around steel shapes and closely spaced reinforcing bars, on 1 side of the steel, uniformly working it until the concrete flushes under the steel to the opposite side before any concrete is placed on the opposite side or over the steel.

Place concrete with means as to avoid segregation of the materials and the displacement of the reinforcement. Remove and discard any concrete that is segregated, is too wet for use, or is not of uniform consistency. Deposit concrete through an approved means when placement operations involve a free drop of concrete by more than 5 feet (1.5 m) to prevent segregation.

Place concrete in a continuous operation between expansion or construction joints.

Thoroughly clean all chutes, troughs, and pipes after each run.

Discharge any flushing water away from the forms and in place concrete.

Once the concrete has taken initial set, avoid jarring the forms or straining the projecting reinforcement ends.

A. Placement Methods. All placement methods are subject to approval.
   1. Truck Chute. Use metal or metal-lined troughs and chutes that extend to the point of deposit. Regulate the discharge.
   2. Pumping Concrete. When concrete pumps are used for placement, prior to use on the first placement of each day, visually inspect the pumps water chamber for water leakage. Do not use a pump that allows free water to flow past the piston.

      If a concrete pump is used as the placing system, discard the pump priming slurry before placement. Eliminating the priming slurry from the concrete may require that several cubic yards of concrete are discharged through the pumping system and discarded.

      Use of a concrete pump requires a written plan to place the remaining concrete if the pump breaks down.

      Provide a pump that produces a continuous flow of concrete without air pockets. Arrange equipment so that the impact on the plastic air content of the concrete is affected as little as possible, and that the freshly placed concrete is not damaged by any form of vibration. If boom angles will vary significantly, furnish means to control air content variation.
   3. Conveying Concrete. When a conveyor is used for placement, prior to use on the 1st placement of each day, visually inspect the conveyor to ensure proper operation. Provide a belt free of tears and holes and operates smooth and free of bouncing and jarring to prevent segregation of the concrete. Protect the concrete while on the conveyor to prevent the concrete's plastic properties from changing.

      Do not use a conveyor exceeding 200 feet (60 m).

      Equip all conveyors with a drop-chute and scraper to prevent segregation and mortar loss respectively.

      Once concrete placement begins, ensure that there is proper and equal edge-distance between the edge of the belt and windrow of concrete.
   4. Bucketing Concrete. When a bucket is used for concrete placement, prior to use on the first placement of each day, visually inspect the bucket for proper working condition and contaminants. The bucket should be clean and free of hardened concrete and excess of release agent.

      Once concrete has been discharged into the bucket, do not place concrete back into a mixer to be altered or remixed.

B. Consolidation. Thoroughly consolidate concrete, except SCC, during and immediately after depositing into the work. Consolidate the concrete by mechanical vibration subject to the following:
   1. Apply the vibration internally unless otherwise approved or as provided herein.
   2. Vibrate the concrete at a minimum 4,500 impulses per minute or as recommended by the vibrator manufacturer.
   3. The vibration must visibly affect the concrete mass, producing a 1-inch (25 mm) slump over a minimum 18-inch (455 mm) radius.
   4. Use enough vibrators to consolidate each batch immediately after it's placed.
   5. Vibrate the concrete around the reinforcement and imbedded fixtures and into the form corners and angles.
   6. Vibrate at the point of deposit in areas of freshly deposited concrete. Slowly insert and remove the vibrators from the concrete. Vibrate to thoroughly consolidate the concrete without causing segregation or forming localized grout areas.
   7. Vibrate at uniformly spaced points and no farther apart than twice the radius over which the vibration is visible.

8. Do not apply vibration directly to or through the reinforcement or to non-plastic sections or layers of concrete. Do not use vibrators to transport concrete in the forms. Use plastic or rubber tipped vibrator heads when placing concrete near epoxy coated reinforcing steel.
9. Supplement vibration by spading and tamping to produce smooth surfaces and dense concrete along form surfaces, in corners and locations impractical to reach with the vibrators.

Refer to Section 501 for consolidation requirements for concrete paving.

551.03.6 Weather and Temperature Limitations

Concreting during hot or cold weather requires an approved written plan to be implemented upon abrupt changes in weather conditions or equipment failures. When required, use Omega HH309A four channel data logging thermometers.

A. Hot Weather Concreting. Defined as job-site conditions that accelerate the rate of moisture loss or rate of cement hydration of freshly mixed concrete. Do not place Classes Deck or Overlay concrete in temperatures exceeding 95 °F (35 °C). Other classes of concrete may be placed in temperatures exceeding 95 °F (35 °C) with Project Manager approval.

When hot weather concreting is anticipated, submit a hot weather concreting plan for review and approval. Include detailed procedures, including production, placement, finishing, curing and protection of concrete during hot weather concreting.

Do not place concrete when the ambient temperature is 85 °F (29 °C) and rising and/or the evaporation rate is greater than 0.2 lb/ft^2/hr. (1 kg/m^2/h) without an approved hot weather concreting plan. Do not place Classes Deck or Overlay without an approved plan when the ambient temperature is greater than 80 °F (27 °C) and/or when the evaporation rate is greater than 0.15 lb/ft^2/hr. (0.75 kg/m^2/h).

When hot weather as defined above exists, monitor site conditions (air temperature, humidity, wind speed) to assess the need for evaporation control measures beginning no later than 1 hour before the start of concrete placing operations. Continue to monitor site conditions at intervals of 30 minutes or less until specified curing procedures have been applied.

1. Materials. Produce concrete at a temperature such that its maximum temperature at discharge will not exceed the specified maximum allowable concrete temperature. Acceptable production methods to reduce the temperature of the concrete include: shading aggregate stockpiles, sprinkling water on coarse aggregate stockpiles; using chilled water for concrete production; substituting chipped or shaved iced for portions of the mixing water; and cooling concrete materials using liquid nitrogen.

   Include in the submittals for hot weather concreting which methods will be used and in what order they will be initiated when multiple methods are to be used. The substitution of other cooling methods will be considered by the Department when requested in the submittal and accompanied by satisfactory supporting data.
2. Construction. Include in the plan methods that will be used to maintain surfaces that will come in contact with the plastic concrete below 85 °F (29 °C). Include methods and equipment that will be used to keep the plastic concrete from cracking (e.g. fogging equipment, burlap, plastic, curing compounds, etc.). Describe devices or procedures that will be used to monitor wind speed, temperature, humidity, and other weather variables determining evaporation rate. Also include a detailed description of curing practices that will be used to supplement standard requirements in hot weather placements.

Protect the concrete against thermal shrinkage cracking due to rapid drops in concrete temperature greater than 40 °F (22 °C) during the first 48 hours unless otherwise specified.

Under hot weather conditions, scheduling placements at other-than-normal hours may be advisable. Concrete showing evidence of plastic shrinkage cracking or thermal cracking will be removed and replaced at no cost to the Department.

B. Cold Weather Concreting. Defined as when the weather forecast predicts air temperatures below 35 °F (2 °C) at any time during the specified curing and protection period following concrete placement. Assume all risk for placing concrete during cold weather. Replace frozen or damaged concrete at Contractor expense.

Remove ice, snow, and frost from the forms, subgrade, adjacent concrete, and reinforcing bars before placing concrete. Do not place concrete on frozen base or subgrade.

When cold weather concreting is anticipated, submit a cold weather concreting plan for review and approval. Include detailed procedures for production, transportation, placement, curing, and temperature monitoring of the concrete during cold weather. Submit the plan a minimum of 15 calendar days prior to any concrete which is scheduled to be placed during cold weather. Prepare and submit a separate cold weather concreting plan for each concrete component which requires different methods of protection from cold weather. Clearly indicate which concrete components are covered by each submittal.

1. Cold Weather Plan. Include, as a minimum, the following items in the cold weather concreting plans:
   a. Materials, details, and locations for insulating blankets, enclosures, or other methods to be used to protect concrete from cold weather.

b. Method for verifying the minimum concrete compressive strength has been reached to allow formwork and cold weather protection removal. Indicate whether cylinder testing or maturity method will be used. If using the maturity method, submit a plan meeting ASTM C1074 requirements.
c. Recording thermometer information and location. Include proposed number and location of thermometers in the concrete.
d. Heating equipment and locations, if used. Provide product information on heating equipment and equipment placement.

2. Fresh Concrete Temperatures. Place fresh concrete with a temperature between 50 and 85 °F (15 and 32 °C).

Eliminate frozen lumps, ice, and snow before aggregates are used in production.

The Contractor may warm stockpiled aggregates with dry heat or steam, but not by applying flame directly or under sheet metal. If the aggregates are in bins, steam or water coils or other heating methods may be used if aggregate quality is not affected. Live steam heating is not permitted on or through aggregates in bins. If using dry heat, increase mixing times enough to permit the dry aggregates to absorb moisture.

Use equipment and methods that heat the materials evenly.

Do not add chlorides, chemical admixtures, or other ingredients to the concrete to prevent freezing.

3. Protection of Concrete. Enclose the structure in such a way that the concrete and air within the enclosure can be kept above 60 °F (15 °C) for a period of 7 calendar days or the specified curing period after placing the concrete. Ensure that the relative humidity remains above 80% within the enclosure.

Before placing concrete, provide adequate preheat to raise the temperature of the formwork, reinforcing steel, adjacent concrete, and subgrade to at least 35 °F (2 °C).

Furnish and place enough temperature probes within the concrete to ensure the temperature of the concrete is adequately monitored. Install a minimum of 3 temperature probes within each concrete element. Ensure that the temperature probes cannot be dislodged by the placement of concrete, vibration, or workers. Include at least 1 additional temperature probe to record ambient outside air temperature. Where heated enclosures are used, include a temperature recording device inside the heated enclosure. Temperature probe locations are subject to approval. Provide access for Department personnel to each probe for downloading recorded data.

4. End of Curing Period. The conclusion of the curing period is defined when field cured cylinders meet design strength, maturity meter readings are satisfactory, or the specified curing days are reached and all temperature recording data has been submitted.

a. Field Cured Specimens. Mold a minimum of 6 field cured cylinders per lot. Cast field-cured cylinders in accordance with MT 101. Place the cylinders at locations designated by the Project Manager and expose them to the same conditions as the concrete being placed until they are removed for testing.

Test field-cured cylinders within 24 hours after removal from cold weather protection according to AASHTO T 22, except that the moist cure period is omitted. Perform tests using a certified testing laboratory. Furnish the Project Manager certified copies of the test results.

Cast enough cylinders to guarantee the required strength has been met for protection removal.

The Department reserves the right to witness selected tests and testing procedures.

Two cylinders constitute a test with the test value being the average of the 2 compressive strengths. The average of all sets must meet the specified strength. Continue curing and protection until the tests indicate the specified compressive strength is reached.

b. Removing Protection. When the curing period has ended and the design strength is met, withdraw protection and heating in such a manner so as not to induce thermal shock stresses in the concrete.

Gradually reduce the temperature of the concrete at a rate not exceeding 15 °F (9 °C) per hour. Do not exceed a temperature differential of 40 °F (4 °C) between the core of the element and the surface of the element. In addition, the temperature differential between the surface of the element and the ambient air shall not exceed 15 °F (9 °C). Ambient air temperature is defined as the temperature at mid-height of the element and 12 inches (305 mm) from the surface of the element.

All concrete must achieve a minimum of 4000 psi (28 MPa) before being exposed to freeze/thaw cycles.

The Contractor is solely responsible for protecting concrete from inclement weather during the entire curing period. Permission given by the Project Manager to place concrete during cold weather in no way ensures acceptance of the work by the Department. Should the concrete placed under such conditions prove unsatisfactory in any way, the Project Manager has the right to reject the work although the plan and the work were carried out with the Project Manager’s permission.

551.03.7 Curing Concrete

Continuously water cure any class of concrete used for bridge deck construction for 14 calendar days as specified below.

Continuously water cure class Overlay-SF for 7 calendar days as specified below.

Continuously water cure class Overlay-LM for 72 hours as specified below, followed by a dry cure. Begin the dry cure at the end of the 72-hour wet cure period by removing the burlap and the polyethylene. Allow the concrete to undergo 48 hours of dry cure. Keep the bridge closed to traffic an additional 48 hours if the air temperature falls below 50 °F (10 °C) during the

cure. Allow no traffic on the overlay surface until the end of the dry cure and the transverse deck grooving has been completed.

Continuously cure all other concrete surfaces for 7 calendar days by either water curing or liquid membrane-forming curing compound as specified below. Design strength must be verified by field-cured cylinders in accordance with AASHTO T 22.

Do not place curing compounds on concrete that is still bleeding.

Protect freshly placed concrete from freezing, high temperatures, large temperature differentials, premature drying, excessive moisture, and moisture loss for the period of time necessary to develop the desired concrete properties.

Protect exposed concrete surfaces from premature drying by covering with canvas, plastic sheets with sealed joints, burlap, or other approved materials. Keep the concrete moist. Continually moisten uncovered surfaces by fogging. Do not allow water to drip, flow, or puddle on the concrete surface during fog misting, when placing the burlap, or at any time before the concrete has achieved final set. Do not use intermediate monomolecular film curing agents (evaporation retarders) as a method to reduce moisture loss.

The concrete surfaces against forms may be cured by leaving the forms in place for at least 7 calendar days.

Keep the concrete surfaces moist after removing forms until surface repair is completed and one of the final cure methods described below is used. Surface repair includes removal of irregularities and repair of all depressions, voids, and air holes.

After placement, cure concrete surfaces as follows:

A. Water Cure. Keep all finished top surface concrete moist with a fine water mist until the burlap is placed.

Place wet burlap in accordance with Subsection 717.01.2 immediately behind concreting operations no later than 15 minutes after finishing. Do not use products having a laminated moisture barrier. Soak burlap for a minimum of 24 hours before use. Keep the burlap wet until concrete reaches sufficient strength to place soaker hoses or other effective means of providing moisture without marring the surface. Once a watering system is placed, place an approved reflective type sheeting or blanket over the watering system in accordance with Subsection 717.01.1 and cover to reduce evaporation. The entire concrete surface must remain moist throughout the full cure period. Ensure the temperature of all water used in the water cure is within 20 °F (11 °C) of the in-place concrete temperature. Secure covers and sheeting to prevent them from being lifted or displaced.

B. Liquid Membrane-Forming Curing Compound. Furnish and uniformly apply a liquid membrane-forming curing compound in accordance with Subsection 717.01.3 or 717.01.4 over exposed surfaces.

Deliver membrane-curing compound to the job in the manufacturer's original container, clearly labeled with the manufacturer's name and contents.

The compound must be ready to use as shipped by the manufacturer. Do not dilute the compound.

Do not use curing compound without providing the Project Manager a manufacturer's product data sheet.

Use white-pigmented compound for pavements.

Use products in accordance with 717.01.4 on curbs, sidewalks, median caps, and barrier rail. Use a product in accordance with 717.01.3 on substructure components, superstructure components other than those requiring a water cure, and all other exposed concrete surfaces. Ensure products furnished in accordance with Subsection 717.01.3 are clear and contain a fugitive dye that makes the film visible on the concrete for at least 4 hours after application but does not affect the concrete surfaces natural color after curing.

Thoroughly mix and apply the compound following the manufacturer's instructions or apply at a rate exceeding 1 gallon per 150 square feet (0.27 L/m^2) and ensure complete coverage with no transparent areas showing obvious color differential.

Apply the curing compound immediately after the finishing operation using a mechanical pressure distribution system to provide uniform coverage. During windy conditions, equip the spray nozzles with hoods.

When concrete is placed in forms, immediately apply the curing compound after form removal if the concrete has not reached its design strength.

A hand-operated sprayer providing uniform coverage may be used to apply liquid curing compound to areas where a mechanical sprayer is impractical.

If the curing membrane is damaged from any cause during the curing period, re-coat the damaged areas immediately.

Do not apply membrane-curing compound to construction joint surfaces. Protect exposed steel during application of curing compounds.

C. Steam-Cure for Precast Concrete Items. Completely enclose or cover the casting beds for steam-cured members using curing blankets or other approved flexible coverings. Provide a minimum 6 inches (150 mm) of free air space between the enclosure or coverings and all concrete surfaces.

Secure flexible coverings to prevent moisture loss. Provide moisture before the cure cycle to aid hydration and prevent surface cracks caused by rapid water loss from the concrete.

Steam may be introduced before starting the cure cycle if the enclosure temperatures are maintained between 50 and 70 °F (10 and 21 °C). Fog-spray or cover the top surfaces of the members with wet blankets within 15 minutes after placing concrete to prevent moisture loss for a 3 hour period before the cure cycle.

Begin the steam-cure cycle after the concrete has been in place at least 3 hours. Maintain steam at 100% relative humidity, applied so it does not damage the surface of the concrete, forms, or tendons.

Raise the ambient temperature within the enclosures no faster than 40 °F (22 °C) per hour to a maximum temperature between 120 and 160 °F (49 and 71 °C). Maintain the temperature until the concrete has reached strength for transfer of prestress or design strength.

Once the cure cycle is complete, cool the precast items by decreasing the temperature within the enclosures no faster than 40 °F (22 °C) per hour until the temperature difference between the inside and outside air is within 25 °F (14 °C), unless otherwise approved.

Keep a curing time-temperature record for each concrete placement within the casting bed. Provide 1 automatic temperature-recording thermometer for each 200 feet (61 m), or fraction thereof, of continuous bed length used. Record curing temperatures continuously for the full curing cycle. Place the temperature sensors at approved locations. Supplement automatic recording thermometers with standard bulb-type thermometers placed at approved locations. Certify the accuracy of automatic recorders once each year or when the recorder accuracy is in question. Steam curing is not permitted without automatic recorders.

The sideforms may be removed at the Contractor's discretion. Assume all responsibility removing forms before breaking the release cylinders. Concrete members damaged from early form removal will be rejected.

The cure cycle may be interrupted a maximum 20 minutes for form removal.

Do not expose the members to below-freezing temperatures within 6 calendar days of casting. In place of the 6-day requirement, the cure time may be based on the concrete strength. The concrete strength is determined by the average strengths of 3 standard 6 x 12-inch (152 x 305 mm) or 4 x 8-inch (102 x 203 mm) cylinders cast from different batches of concrete used in each casting. Expose these cylinders to the same cure and temperature conditions as the precast items. Immediately test the cylinders according to AASHTO T 22 without further curing, once they are removed from the cure area.

Curing may be discontinued if the average strengths of the 3 cylinders equals or exceeds specified strengths. Protect the member from freezing temperatures for the 6-day period if the average compressive strength fails to meet specified strength. Cool all members as specified in this Subsection.

Cast compression cylinders for field tests of the 28-day strengths following MT 101. Cast the number of test cylinders as required in Subsection 551.03.8(C) and MT 111.

The Contractor may submit in writing, alternate curing methods, for approval.

551.03.8 Testing and Acceptance of Concrete

Construct any products that are not cast-in-place, and not produced at a PCI, ACPA or NPCA certified precast plant, in accordance with Subsection 605.03. These products will be evaluated in accordance with Subsection 551.03.8(C) for the class of concrete specified.

A. Pre-testing of Concrete (Classes Structure, Deck and Overlay). Pre-testing is not required for concrete placements smaller than 7 cubic yards (m^3). The Department will perform pre-tests for air content and slump at the start of each concrete production run and any time there is a significant change in the pumping configuration or concrete placement as determined by the Project Manager. Meet the following requirements:
   1. Discharge and waste a minimum of 0.25 cubic yards (0.2 cubic meters) of concrete.
   2. Collect a sample.
   3. If slump and air content pre-tests indicate the sampled concrete meets applicable specifications, placement may begin.
   4. If a pre-test produces a failing result, the truck may be dosed with approved admixtures included in the mix design, in accordance with Subsection 551.03.3(H).
   5. If after all additions in accordance with Subsection 551.03.3(H) are made and a second pretest again produces a failing result, the truck will be rejected. The testing process will be repeated on subsequent trucks until passing air and slump results are achieved. Pre-test results are not used for concrete lot acceptance.

B. Sampling and Testing. Furnish an adequate and representative sample of concrete in accordance with AASHTO R 60 from the point of placement to an area designated by the Project Manager for testing of concrete properties and molding of test specimens. Do not drop or agitate samples. The sampling and transport must be witnessed by the Department. The Department will take possession of the sample and begin the following applicable tests.
   1. Compressive Strength Testing. Furnish samples for determining compressive strength following AASHTO R 60. Test cylinders will be cast and cured following MT 101 and tested in accordance with AASHTO T 22 at a frequency determined by MT 601. Test cylinders for SCC will be cast and cured in accordance with MT 117. Compressive strength tests may be molded at any time if inconsistency between batches is identified or suspected. A compressive strength set consists of 4 test cylinders made at the same time from the same batch of concrete. Tests for plastic properties will also be run from the same sample used for compressive strength tests.

      The Contractor may make additional cylinders to determine strength gain and to maintain job control.

      Standard compressive strength tests will be made at 7 and 28 days, except as specified below for concrete used in prestressed members.

The compressive strength results of the cylinders tested will determine if the concrete meets the required compressive strength in Table 551-3 or specified in the contract.

2. Testing of Plastic Concrete. Perform quality control sampling/testing during the concrete placement, including air content, temperature, and slump to maintain job control.

   Furnish samples for determining slump, air, and temperature in accordance with AASHTO R 60. Slump will be tested in accordance with AASHTO T 119. Air content will be determined in accordance with AASHTO T 152. Temperature will be tested in accordance with ASTM C1064 at a frequency determined in accordance with MT 601. Plastic properties tests may be run at any time if inconsistency between batches is identified or suspected.

   Slump flow and air content for SCC will be evaluated in accordance with AASHTO T 347 and AASHTO T 152.

   Plastic concrete will also be subjected to a visual test for segregation. If segregation is identified by a “halo”, bleeding, aggregate agglomerations, or aggregate settlement (identified by a high sheen or bubbling) during the slump test, do not place the concrete. Take immediate steps to resolve the problem. Remove and replace any concrete placed showing signs of segregation at no expense to the department.

3. Durability Testing. When applicable, furnish samples for determining permeability following AASHTO R 60. Test cylinders will be cast and cured following MT 101 and tested in accordance with AASHTO T 358.

   The Department may test hardened air content in accordance with ASTM C457 for acceptance.

4. Gradations. Samples for determining gradations of aggregates for concrete will be sampled in accordance with MT 201 and tested in accordance with MT 202. Combined gradations are determined in accordance with MT 122.

C. Acceptance of Concrete. The concrete must meet all contract specifications and the following:

1. Classes General, Deck, Pave, Structure, Overlay and Drilled Shaft Concrete. These classes of concrete are evaluated for acceptance on a lot-by-lot basis.

   An individual lot is defined as a single day’s placement or every 200 yd^3 (150 m^3) of concrete placed (i.e. 200 yd^3 = 1 lot, 400 yd^3 = 2 lots, etc.) whichever is less, excluding Class Pave. If predetermined, the Project Manager may elect to define a lot as the cumulative concrete placed when multiple small placements result in a quantity of 30 cubic yards or less over 3 consecutive placement days, not spanning more than 5 business days. An individual lot of Class Pave concrete is defined as a single day’s placement, or every 1,000 yd3 (750 m3) of concrete placed, whichever is less. Each lot is accepted or rejected based on the lot acceptance air tests, strength tests, gradation tests and when applicable, permeability tests. The pay factors for each lot accepted are determined from Table 551-5, 551-6, 551-7, 551-8, and 551-9.

   The overall lot pay factor (OLPF) will be calculated for bid items as shown in Table 551-10 and will be applied as a line item adjustment on the estimate.

TABLE 551-10
ITEMS INCLUDED FOR PAYFACTOR ADJUSTMENT

Class	Items
Deck	Include all items except metal bridge rail and bridge deck repair
Drilled Shaft	Include all items
Overlay-SF	
Pave	
Structure	Include concrete class bid items and Revise Barrier items
General	Include concrete class bid items Include items in Subsection 608 Include items in Subsection 609 Include items measured by the volume Exclude all other items

Note 1: The OLPF may be evaluated on other contract items that have significant equivalent concrete quantities.

Pay factors will not be calculated for items measured and paid for by the Lump Sum or precast items accepted in accordance with Section 554. Except for concrete barrier rail, pay factors will not be calculated for items measured and paid for by the each. Concrete barrier rail and other items constructed in accordance with Section 605 will be tested and accepted the same as cast-in-place items.

a. Strength. A minimum of 2 standard compressive strength sets will be made for each lot. Each set will be made from concrete taken from a separate batch or load randomly selected from all loads or batches in the lot. For a lot less than 30 cubic yards (23 m^3), the Project Manager may elect to make 1 set of compressive strength cylinders to represent that lot.

Three cylinders from each set of cylinders are tested for compressive strength at 28 days and the fourth is tested at 7 days. The test result is the average of the strengths of the 3 individual 28 day cylinder specimens unless an outlier is identified.

For classes Deck and Overlay, if the average 28-day strength of all sets within a lot is ±500 psi of the mix design target and greater than 4000 psi, the lot is eligible for a 1.02 PF_S. Any results below 4000 psi will be evaluated in accordance with Table 551-5.

The Department will analyze the test results for outliers. The results of the 2 specimens with the closest compressive strengths will be averaged. If the strength result of the remaining cylinder differs by more than 10% from that average, it will be considered an outlier. If an outlier is identified, that specimen will be removed and, the average strength of the set will be determined using the remaining 2 specimens.

The lot acceptance strength is the average of all sets for the lot.

TABLE 551-5
CONCRETE STRENGTH PAY FACTORS

Strength Pay Factors Classes Deck, Overlay, Structure, General, Pave, and Drilled Shaft Concrete lot acceptance strength, x psi (1 psi = 6.9 kPa)	
strength, x (psi)	strength pay factor, PF_S
x	$PF_S = 1.00$
x 3,500	$PF_S = 1.00 - \frac{0.15(4000 - x)}{500}$
3 x 2 8	$PF_S = 0.85 - \frac{0.85(3500 - x)}{700}$
2,800 > x	PF_S = 0, remove and replace

The pay factors shown will be used when the department determines the concrete is acceptable at less than the specified strength. The Department may require removal and replacement or corrective action for any concrete not in accordance with the required strength.

b. Air Content Concrete air content will be determined in accordance with AASHTO T 152 or ASTM C457 on the same sample used to make the compression test cylinders for acceptance and on samples taken according to MT 601. A separate air content pay factor will be computed for each test result and the lot air content pay factor will be the average of the individual test result pay factors. The pay factor for each lot based on air content is determined from Table 551-6.

TABLE 551-6
AIR CONTENT PAY FACTORS

Lot Acceptance, Air Content			
Classes General, Pave, Deck, Overlay, and Structure Concrete		Used when mix design incor orates 1 -inch nominal maximum aggregate gradation	
Air content, x (%)	Air content pay factor, PF_{AC}	Air content, x (%)	Air content pay factor, PF_{AC}
x > 7.5%	$PF_{AC} = 1.00$	x 6.5%	$PF_{AC} = 1.00$
7 % x 6.5%	$PF_{AC} = 1.03$	% x 5.5%	$PF_{AC} = 1.03$
6.5% > x 5.0%	$PF_{AC} = 1.00$	5.5% > x 4.0%	$PF_{AC} = 1.00$
5.0% > x 3.0%	$PF_{AC} = 1.0 - 0.25(5.0 - x)$	4.0% > x 2.5%	$PF_{AC} = 1.0 - 0.33(4.0 - x)$
3.0% > x	Remove and Replace	2.5% > x	Remove and Replace

The pay factors shown will be used when the department determines the air content of the in-place concrete is acceptable at percentages less than specified. The Department may require removal and replacement or corrective action for any concrete not in accordance with the required air contents. No incentive will be paid if any individual air test within the lot is outside the range specified in Table 551-3.

In addition to the air content pay factor, coating concrete with an approved penetrating epoxy sealer at no cost to the Department will be required any time concrete having an air content less than 4.0% (3.5% for

concrete containing 1½-inch nominal aggregate) for Classes Deck, Overlay, and Structure concrete allowed to remain in place.

Air content pay factors will not be used on Class Drilled Shaft concrete.

c. Permeability. Concrete permeability will be determined at 28 days (Table 551-7) or 56 days (Table 551-8) in accordance with either AASHTO T 358 (Table 551-7). At least one set of compressive strength cylinders per lot will also be tested for permeability. The lot acceptance permeability is the average of the test results for the lot. If 6-inch by 12-inch specimens are required based on use of 1 1/2-inch nominal aggregate, the acceptance values in Tables 551-7 and 551-8 will be reduced by 20%. The pay factor for each lot based on permeability is determined from Table 551-7 or 551-8.

TABLE 551-7
28-DAY CONCRETE PERMEABILITY PAY FACTORS

Lot Acceptance, Permeability, x (-cm) Classes Deck and Overlay[1]	
lot permeability test result, x (-cm)	permeability pay factor, PF_P
x 21	$PF_P = 1.05$
21 x 12	$PF_P = 1.00$
12 x 10	$PF_P = 1.00 - \frac{0.30(12 - x)}{2}$
10 > x	$PF_P = 0.70$

Note 1: If Class Structure is specified for a bridge deck, the incentive may be paid, but no deduction will occur for permeability results.

TABLE 551-8
56-DAY CONCRETE PERMEABILITY PAY FACTORS

Lot Acceptance, Permeability, x (-cm) Classes Deck and Overlay	
lot permeability test result, x (-cm)	permeability pay factor, PF_P
x 21	$PF_P = 1.00$
21 x 18	$PF_P = 1.00 - \frac{0.30(21 - x)}{3}$
18 > x	$PF_P = 0.70$

The pay factors shown will be used when the department determines the permeability of the in-place concrete is acceptable with results less than specified. The Department may require removal and replacement or corrective action for any concrete not in accordance with the required permeability.

d. Gradation. Concrete aggregate gradations will be determined in accordance with MT 202 or MT 122, if applicable. A minimum of one gradation test will be performed per 200 cubic yards (150 m^3) excluding class Pave. The test result will be used in the OLPF calculation for each lot of concrete placed within that 200 cubic yards (150 m^3). For class Pave, a minimum of one gradation test will be performed per 1000 cubic yards (750 m^3).

1) Conventional Gradations. For concrete designed with conventional gradations, the Department will calculate the pay factor for the gradation using the following formula.

$$PF_G = 1.00 - \frac{(x)}{1000}$$

Where:
x = The sum of the individual percentages out of range on each aggregate fraction.
PF = Pay Factor

2) Optimized Gradations. For concrete designed with optimized gradations the Department will calculate the pay factor for the gradation using the following formula

$$PF_G = 1.00 - \frac{0.25(x) + 2(y)}{250}$$

Where:
x = The sum of percentages out of tolerance on each individual aggregate fraction (each rounded to the whole number).
y = Percentage out of tolerance on the No. 200 (0.075 mm) sieve fraction (rounded to the tenth of a percent).
PF = Pay Factor
If all gradation tests in the lot produce passing results, the following pay factor will be used:

$$PF_G = 1.05$$

The following formulas are used to calculate the OLPF and unit price adjustment ADJ. All pay factors (PF_S, PF_P, PF_{AC}, and PF_G) must be 1.00 or greater for the production lot to be eligible for positive ADJ (incentive). No OLPF can exceed 1.15.

$$OLPF = PF_S \times PF_{AC} \times PF_P \times PF_G$$
$$ADJ = (OLPF - 1) \times Price$$

Where
ADJ = Price adjustment per pay unit to be applied to the production lot quantity
Price = Contract unit price for the pay item

If a pay factor is not applicable to a specific class of concrete, the pay factor (PF) will be 1.00. Use Table 551-9 to determine pay factors applicable to specific classes of concrete.

TABLE 551-9
PAY FACTORS FOR CONCRETE

PF Type	Deck	Overlay	Structure	General	Drilled Shaft	Pave
PF_S	X	X	X	X	X	X
PF_{AC}	X	X	X	X		X
PF_P	X	X				
PF_G	X	X	X	X	X	X

2. Class Pre Concrete. Class Pre concrete is evaluated for acceptance on a lot-by-lot basis based on the average of the 28-day compressive strength cylinders and variation in test results as measured by the standard deviation.
   Each lot will be judged against the formula:

   F'c + 0.35S

   Where:
   S is the standard deviation of the strengths for the three 28-day cylinders.
   F'c is the concrete strength required for final acceptance as specified in the contract.

   A lot is defined as all the concrete that is placed in a single pre-cast prestressed member.
   Lots with any actual average cylinder strengths less than that calculated from the above formula will be rejected.
   Three 28-day compressive test cylinders will be made for each lot, and each 28-day test cylinder sample will be randomly selected from all batches or loads.
   The strengths of other cylinders made from a sample and tested at an earlier age will not be considered for acceptance purposes.
   The cylinders for acceptance will be cast in accordance with MT 101, sampled in accordance with MT 111 and tested in accordance with AASHTO T 22.
   The cylinders will be cured within the curing enclosure under the exact conditions and methods used to cure the prestressed member until transfer of pre-stress. After transfer of pre-stress, the cylinders will be transported and continue curing in accordance with MT 101.
3. Controlled Low Strength Material. CLSM will be tested once per project for placements that support traffic loads. CLSM will be accepted by certification for placements that do not support traffic loads. CLSM will be tested in accordance with MT 601. Do not apply additional loads until CLSM has reached its design strength.

4. Small Concrete Quantities. The Project Manager may accept 7 cubic yards (5.4 m^3) or less of concrete without a formal mix design. Submit a batch proportion sheet to the Project Manager for approval before use. Classes Deck, Overlay, and Structure concrete are excluded from this exception.

551.04 METHOD OF MEASUREMENT

Concrete is measured by the cubic yard (m^3) in accordance with Subsection 552.04, unless otherwise specified.

Class Pave concrete is measured for payment in accordance with Subsection 501.04.

Class Pre concrete is measured for payment in accordance with Subsection 553.04.

Concrete used in pre-cast concrete products is measured for payment in accordance with Subsection 554.04.

551.05 BASIS OF PAYMENT

Payment for the completed and accepted quantities is made under the following:

Pay Item	Pay Unit
Concrete	Cubic Yard (m^3)

Class Pave concrete is paid for in accordance with Subsection 501.05.

Class Pre concrete used in prestressed concrete members is paid for in accordance with Subsection 553.05.

Concrete used in pre-cast concrete products is paid for in accordance with Subsection 554.05.

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work in accordance with the contract.

552.02 MATERIALS — Page 251 — 7-14-16

Within the list of materials, rescind only the line for Reinforcing Steel and Structural Steel and replace with the following:

Reinforcing Steel and Structural Steel 555 and 711

552.03.3 FORMS — Page 251 — 5-25-17

Rescind the seventeenth paragraph (that begins, “Fit metal tie …”) and eighteenth paragraph (that begins, “Use metal tie …”) and replace with the following:

Furnish metal or fiberglass tie rods or anchorages within the forms with cones or other devices that permit the rod and anchorage to be removed to 1-inch (25 mm) below the surface without damaging the concrete.

Use metal or fiberglass tie fittings that leave the smallest possible size cavities. Dry pack cavities with cement mortar to produce a sound, smooth, even finished surface closely matching that of the adjacent concrete after form removal.

552.03.10 REMOVAL OF FORMS AND FALSEWORK — Page 255 — 5-25-17

Add the following paragraph at the beginning of the Subsection, prior to the first paragraph:

Vertical forms may be removed 24 hours following the conclusion of the concrete placement. Other forms and falsework may be removed at 14 calendar days or 80% of the specified design strength.

552.03.18 SILANE SEALER — Page 280 — *11-14-19

Rescind the first paragraph (that begins, “Apply Silane sealer…) and replace with the following:

Apply Silane sealer to new and replacement full depth bridge decks that will not receive a polymer overlay in the same year. Apply silane sealer after the deck has been cast for at least 28 days and after transverse deck grooving is completed.

552.03.19 BRIDGE DECK CRACK SEALING — Page 262 — 1-18-18

Add the following paragraph at the beginning of the Subsection, prior to Part (A):

Furnish bridge deck sealant in accordance with Subsection 717.02.

553.02.2 REINFORCING STEEL — Page 267 — 7-14-16

Within first paragraph, rescind first sentence (that begins, “Furnish reinforcing steel…”) and replace with the following:

Furnish reinforcing steel in accordance with Section 555 and Subsection 711.01.1.

553.03.1 FABRICATION Page 268 10-9-14

Add the following sentences to the end of the second paragraph, (that begins, “Furnish a copy…”):

New manufacturing plants may operate under the parent plant’s quality assurance and control programs for a maximum of 18 months from the date of opening. Plants currently operating under this exemption may do so only until January 1, 2016.

553.03.11 TRANSFER OF PRESTRESS Page 274 12-11-14

Within the tenth paragraph, rescind the second (last) sentence, (that begins, “The Project Manager may…”) and replace with the following:

The Engineer may direct other tests to determine release strengths.

554.01 DESCRIPTION Page 279 7-14-16

Rescind the first (only) paragraph and replace with the following:

This work is the furnishing and installing of reinforced precast concrete bridge members, precast curbs, cattle guard bases, and other precast concrete products.

554.03 CONSTRUCTION REQUIREMENTS Page 279 7-14-16

Add the following paragraph:

Construct any products that are not cast-in-place, and not produced at a PCI, ACPA or NPCA certified precast plant, in accordance with Subsection 605.03. These products will be evaluated on a lot-by-lot basis in accordance with 551.03.8(C) for the class of concrete specified.

556.03.1 PRE-QUALIFICATION FOR STEEL FABRICATORS Page 287 10-9-14

Rescind Subsection 556.03.1 and replace with the following:

Use metal fabricators that are pre-qualified under the AISC Quality Certification Program for the items listed below. The Department will make an exemption for new manufacturing plants that are of the same ownership as an existing certified plant, provided the new manufacturing plant operates under the same quality assurance and control programs as the certified plants, modified to address any production differences, and all fabrication is performed under the direct supervision of a quality assurance and control manager provided by an existing pre-qualified plant. Direct supervision means that the quality assurance and control manager is on site during all fabrication performed in the new fabrication plant and is responsible for the quality assurance and control activities. For new manufacturing plants, submit and receive approval of any proposed modifications to the parent plant’s quality assurance and control program prior to beginning production. Allow 30 business days from the date submitted for Department review and approval. New manufacturing plants may operate under the parent plant’s quality assurance and control programs for a maximum of 18 months from the date of opening. Plants currently operating under this exemption may do so only until January 1, 2016. Items not listed may be fabricated by non-certified shops. Use metal fabricators having the following AISC quality certification categories:

1. Use fabricators having Advanced Bridges (ABR) certification to fabricate the following:
   a. Fracture critical members and attachments. Fabricators must have the fracture critical endorsement (F).
   b. Tub, trapezoidal or closed box girders, large or non-preassembled trusses [over 200 feet (60 m)], cable supported bridges, bascule bridges, arches and bridges with tight radius.
2. Use fabricators having Intermediate Bridges (IBR) certification to fabricate the following:
   a. Fracture critical members and attachments. Fabricators must have the Fracture Critical Endorsement (F).
   b. Rolled beams with field or shop splices, either straight or with a radius over 500 ft.
   c. Built-up I-shaped plate girders with constant depth, either straight or with a radius over 500 feet (150 m).
   d. Built-up I-shaped plate girders with variable web depth (e.g., haunched), either straight or with a radius over 1000 feet (305 m).
   e. A truss with a length of 200 feet (60 m) or less that is entirely or substantially pre-assembles at a certified facility and shipped in no more than three sub-assemblies.
   f. Welded floor beams.

g. Diaphragms for horizontally curved girders.

3. Use fabricators having Simple Bridges (SBR) certification to fabricate the following:
   a. Non-spliced rolled beams.
   b. Non-spliced rolled floor beams.
   c. Non-spliced rolled diaphragms for straight girders (does not include diaphragms used for concrete beams).
4. Use fabricators having an SBR or Bridge and Highway Metal Component Manufacturers certification to fabricate the following:
   a. Bridge expansion joints.
   b. Steel grid decking.
   c. Bridge expansion bearings.
   d. Overhead sign bridge and cantilever sign structures.
   e. Lighting poles and anchor bases.

556.03.5 QUALITY CONTROL Page 290 1-18-18

Within Subsection 556.03.5 add the following Part (6) following Part (5):

3. NDT, Phased Array Ultrasonic Testing (PAUT). This method may be used in place of RT and UT for the inspection of CJP groove welds. Perform all aspects of PAUT inspection in accordance with AWS D1.5, Annex K. Provide for approval, a submittal package 30 days prior to inspection. Provide all information, qualifications, etc. needed to determine the requirements of Annex K can be met. Include the inspector's history of successful NDT projects specific to PAUT and the requirements of AWS D1.5.

556.03.8 BOLTED CONNECTIONS - HIGH-TENSILE-STRENGTH BOLTS Page 291 1-18-18

Within Part (A)(2), rescind the third (last) paragraph (that begins, "Provide a Class…") and replace with the following:

Provide a Class B finish, per AASHTO LRFD Bridge Construction Specifications for all faying surfaces.

Within Part (D), row 2 of Table 556-2 – Bolt Substitutions, rescind, "ASTM A325M" and replace with "Grade A325M or Grade A490M".

Within Part (D) row 2 of Table 556-2 – Bolt Substitutions, rescind, "ASTM A325" and replace with "Grade A325 or Grade A490".

556.03.11 ASSEMBLING STEEL Page 315 *11-14-19

Within Part B. Field Work, add the following sentence to the end of the third paragraph (that begins, "Do not begin…):

Do not place deck forms or other loads on straight steel girders until all girder splice bolts are fully tensioned. For curved structures, fully tension all bolts before placing deck forms or other loads.

558.02.3 REINFORCING STEEL Page 299 7-14-16

Add the following Subsection:

558.02.3 Reinforcing Steel
Furnish all reinforcing steel in accordance with Section 555 and Subsection 711.01.

558.03.1 SUBMITTALS Page 299 7-14-16

Within Part A, rescind Number 3 (that begins, "Method to clean…") and replace with the following:

3. Methods to clean shaft excavation including details for air-lift systems.

Rescind Part B (that begins, "Name and experience…") and replace with the following:

B. Name and experience record of Contractor, and Superintendent and driller(s) that will perform the drilled shaft work on this project. Include all experience in the last 10 years.

558.03.4 SHAFT EXCAVATION Page 300 7-14-16

Within the first paragraph, rescind the first sentence (that begins, “Use excavation methods…”) and replace with the following:

Use excavation methods that provide contact with firm, undisturbed soil or rock with the sides and bottom of the drilled shaft.

558.03.7 PERMANENT CASING Page 300 7-14-16

Add the following Bullet D:

D. Limit the excavation in advance of the casing tip to no more than 10 feet (3 m) unless synthetic slurry is being used.

558.03.8 TEMPORARY CASING Page 301 7-14-16

Rescind Subsection 558.03.8 and replace with the following:

558.03.8 Excavation Stability

Do not use slurry construction methods as an alternative to or in conjunction with temporary casing unless specified in the contract. Use casings to facilitate shaft construction and prevent sloughing and caving of the shaft sidewalls. The contract may specify temporary casing minimum elevations. Place the temporary casing(s) deeper if necessary to prevent material from entering the shaft excavation. Use casing with an outside diameter no less than the specified diameter of the shaft. Limit the excavation in advance of the casing tip to no more than 10 feet (3 m) unless synthetic slurry is being used. During casing extraction, maintain a sufficient level of fluid in the casing to counteract external hydrostatic pressures but no less than 5 feet (1.5 m) of positive head. Maintain an adequate level of concrete within the casing to ensure that fluid trapped behind the casing is displaced upward and discharged at the ground surface without contaminating or displacing the shaft concrete. Temporary casings that have become bound or fouled during shaft construction and cannot be removed are considered to be a defect in the drilled shaft. Correct defective shafts using approved methods at no cost to the Department. Corrective action may consist of, but is not limited to, the following:

1. Removing the drilled shaft concrete and extending the drilled shaft deeper to compensate for the loss of frictional capacity to the cased zone.
2. Providing straddle drilled shafts to compensate for capacity loss.
3. Providing a replacement drilled shaft.

558.03.10 CLEANING Page 301 7-14-16

Rescind Subsection 558.03.10 and replace with the following:

558.03.10 Cleaning

Remove all loose or disturbed material from the bottom of the shaft excavation immediately prior to placing reinforcing steel and concrete. After cleaning, no more than 1-inch (25 mm) of loose or disturbed material is permitted in the bottom of the shaft.

For wet shafts founded in rock, use an air lift to demonstrate that the shaft is clean. Use an air-lift system meeting the following requirements:

1. Sufficient length to discharge outside of the shaft;
2. Minimum of 4-inch (100 mm) diameter;
3. Compressed air input line located within 12 inches (300 mm) of the bottom of the lift pipe.
4. Air compressor capable of producing 185 CFM at 100 psi (5.2 m^3/min at 6.9 bar).
5. Meet all applicable environmental requirements relating to discharge.

During final cleanout and until concrete placement is complete, maintain the fluid level within the shaft at a level of 5 feet (2 m) or more higher than the water level present outside of the shaft.

558.03.11 INSTALLATION OF CROSS-HOLE SONIC LOGGING (CSL) TUBES Page 301 7-11-19

Rescind the first paragraph and replace with the following:

Use 1½-inch (38 mm) nominal diameter schedule 40 steel CSL access tubes. Provide an end plug at the lower end of the pipe and make all joints watertight. Install the CSL access tubes evenly spaced around the reinforcing cage and inside of hoops and spiral reinforcing steel shown in the contract, using connectors that will allow the tubes to slide through them when force is applied. Position the connectors so that couplings will not prevent the tubes from sliding. Ensure tubes extend to the shaft bottom. After inserting the shaft reinforcing steel, drive each tube down until contact is made with the shaft bottom. Fill the CSL access tubes with potable water prior to or immediately after placing concrete in the drilled shaft. Temporarily cap the top of the tubes to prevent debris or concrete from entering the tubes.

558.03.12 REINFORCING STEEL Page 302 7-14-16

Within the first paragraph, rescind the fifth sentence(that begins, “Use non-corrosive…”) and replace with the following:

Use non-corroding, roller-type spacers or other non-corroding devices as approved by the Project Manager along the steel cage length and around the steel cage perimeter to align and maintain clearance from reinforcing cage to edge of casing during concrete placement.

Within the first paragraph, rescind the seventh (last) sentence(that begins, “Remove the steel…”) and replace with the following:

Remove the steel cage and re-inspect the excavation as directed by the Project Manager if the concrete placement is not started within 3 hours of placing the steel cage in position.

558.03.15(A) CROSS-HOLE SONIC LOGGING Page 302 7-11-19

Within the first paragraph, rescind the fifth sentence (that begins, “When the CSL…”) and the sixth sentence (that begins, “Permanently cap the…”) replace with the following:

When the CSL testing access tubes are no longer needed for testing, as determined by the Project Manager, cut off the tubes flush with the top surface of the drilled shaft. Remove water and fill CSL tubes with grout. Protect tubes from freezing until water is removed.

558.04.6 CSL TUBES AND TESTING Page 303 7-11-19

Rescind Subsection 558.04.6 and replace with the following:

558.04.6 CSL Tubes and Testing

Include all costs associated with furnishing and installing, and grouting CSL access tubes and any required extensions and providing a power source in the Drilled Shaft pay item. No measurement or payment will be made for construction delays resulting from the initial CSL drilled shaft testing. The Department will extend the contract time by 1 day for each day over 12 calendar days required to complete the CSL drilled shaft testing. The Department will pay the costs for the initial CSL drilled shaft testing.

If a defect is found based on the CSL drilled shaft testing, coring, or other physical investigation, the contractor is responsible for all costs associated with the physical investigation, engineering design, shaft repairs, and any construction delay costs. Pay the costs of CSL drilled shaft retesting of the repaired drilled shafts.

If no defect is found in the drilled shaft based on the physical investigation, the investigation will be considered extra work, and paid for in accordance with Subsection 109.04, and considered for time adjustment in accordance with Subsection 108.07.

558.05 BASIS OF PAYMENT Page 304 7-14-16

Add the following paragraph following the last paragraph:

Air-lifting is not measured separately for payment. Include costs for all airlifting in the Drilled Shaft Item.

559.03.3 PILE BEARING RESISTANCE Page 307 4-25-19

Within Part A, rescind the third sentence (that begins, “The Department will…”) and replace with the following:

The Department will determine required bearing resistance based on a wave equation analysis.

Within Part (B)(2), within the forth paragraph, rescind the second sentence (that begins, “After initial…”) and replaxce with the following:

After initial driving, wait 48 hours or longer if directed by the Project Manager, then re-drive each dynamic load test pile with the instruments attached.

559.03.5 SERVICE PILE Page 310 4-25-19

Within the fourth paragraph rescind the first sentence (that begins, “When a re-drive…”) and replace with the following:

When a re-drive of the service pile is required, re-drive the pile 48 hours after initial driving, or longer if directed by the Project Manager, and do not drive the pile below cut off elevation.

561.03.3 PROCEDURES Page 313 10-9-14

Under (A) Hydrodemolition, rescind the third paragraph (that begins, “Remove any remaining…”).

Following Subsection (B), rescind the first and second paragraphs (that begins, “Remove concrete in…”) and replace with the following:

Remove concrete, in areas designated for removal that milling equipment cannot reach, with chipping hammers no larger than a nominal 15 pound (7 kg) class or other equipment as approved by the Project Manager. This work is measured and paid for as Bridge Deck Milling.

Thoroughly clean the deck of all aggregate, paste, residue, oil, and any other substance that may interfere with the repair or overlay concrete. Use cleaning methods that do not damage remaining concrete, reinforcing steel, or that cause debonding of remaining concrete and reinforcing steel.

561.04 METHOD OF MEASURMENT Page 314 7-14-16

Within the first paragraph, rescind the first sentence (that begins, “Bridge deck milling…”) and replace with the following:

Bridge deck milling is measured by the square yard (m^2) of deck surface removed.

562.02.1 REINFORCING STEEL Page 315 7-14-16

Add the following Subsection:

562.02.1 Reinforcing Steel

Furnish all reinforcing steel in accordance with Section 555 and Subsection 711.01.

562.03.3 LOCATION AND INSPECTION OF REPAIR AREAS Page 315 10-9-14

Rescind bullets 1, 2 and 3 and replace with the following:

1. Complete milling operations, if included in the contract, prior to the locating of Class A or B repair areas
2. Use compressed air to dry the deck and to blow it clean of debris. The Project Manager will then locate and mark areas of Class A and Class B deck repair.
3. Notify the Project Manager if repair work reveals areas which differ from the marked areas.

562.03.4 CONCRETE REMOVAL Page 315 10-9-14

Within bullet 2, rescind the third sentence (that begins, “If the bond…).

562.03.5 REINFORCING STEEL Page 316 10-9-14

Within the first paragraph, rescind the second (last) sentence (that begins, “Remove concrete as…).

562.04 METHOD OF MEASUREMENT Page 317 10-9-14

Rescind the fourth (last) paragraph (that begins, “Replacement of reinforcing…) and replace with the following:

Replacement of reinforcing bars will be measured and paid for in accordance with Subsection 109.04. Replace any reinforcing bars damaged by Contractor operations at Contractor expense. When not located in an area of Class A or B repair, work necessary to provide reinforcement clearance in accordance with Subsection 562.03.5 will be measured and paid for in accordance with Subsection 109.04.

563.02.2 AGGREGATE Page 319 4-25-19

Rescind the bullet 2 (that begins, “Furnish ¾-inch…) and replace with the following:

2. Furnish aggregate in accordance with Table 551-3.

Within Part (4), replace MT 221 with AASHTO T 255.

563.05 BASIS OF PAYMENT Page 322 7-14-16

Following the first paragraph, rescind the Pay Item/Pay Unit Table and replace with the following:

Pay Item	Pay Unit
Concrete – Class Overlay	Cubic Yard (m^3)

564.03 CONSTRUCTION REQUIREMENTS Page 323 3-10-16

Within Table 564-1, within the row showing Substructure: Walls, Footings, Columns, rescind the row showing Deviation from Plumb and replace with the following:

Substructure: Walls, Footings, Columns	Deviation from Plumb	±0.2%

Within Table 564-1, rescind the row showing Pre-Stressed Concrete Beam requirements and replace with the following:

Pre-Stressed Concrete Beams	Refer to Subsection 553.03.15

602.04.2 RELAY PIPE CULVERTS Page 331 7-14-16

Rescind Subsection 602.04.2 and replace with the following:

602.04.2 Relay Pipe Culverts

Relay pipe culvert is measured by the foot (meter) along the flowline of the re-laid lengths. Excavation required to relay pipe culverts is not measured separately for payment.

603.03.4 BACKFILLING Page 336 2-26-15

Add the following sentence at the end of the fourth paragraph (which begins “Compact backfill equally…”):

Meet the moisture and density requirements of Subsection 203.03.3.

603.03.5 RESTORATION AND MAINTENANCE OF EXISTING PAVEMENT Page 336 2-26-15

Rescind Subsection 603.03.5 and replace with the following:

Restore the existing pavement excavated for pipe installation using material equal to or better than the in place pavement. Restoration includes replacing and compacting excavated aggregate base with materials equal to those in the existing roadway and placing either CLSM or new plant mix surfacing equal to the existing, but not less than 3 inches (75 mm) in thickness. Place and compact the replacement plant mix surfacing to match the adjacent pavement providing a smooth riding surface, including the joints.

Maintain the restored areas in good condition until the new surfacing is placed.

603.04.3 BEDDING AND FOUNDATION MATERIAL Page 337 12-08-12

Rescind the title of Subsection 603.04.3 and replace with the following:

603.04.3 GRANULAR BEDDING, BEDDING AND FOUNDATION MATERIAL

Rescind and replace the first paragraph with the following:

Bedding material is measured by the cubic yard (m^3) in place for pipes greater than 48-inch (1.2 m) diameter, and for all sizes of storm drain trunklines and laterals. Include the cost of bedding material for pipes 48-inch (1.2 m) diameter or less in the cost of the pipe. Foundation material is measured by the cubic yard (m^3) in place.

603.04.5 GRANULAR BEDDING MATERIAL FOR STORM DRAINS Page 337 12-8-16

Rescind Subsection 603.04.5.

604.02.3 REINFORCING STEEL Page 339 7-14-16

Within first paragraph, rescind first sentence (that begins, “Furnish reinforcing steel…”) and replace with the following:

Furnish reinforcing steel in accordance with Section 555 and Subsection 711.01.1.

605 CONCRETE BARRIER RAIL Page 341 *11-14-19

Add the following Section 605:

SECTION 605
CONCRETE BARRIER RAIL

605.01 DESCRIPTION

This work is the constructing and installation of concrete barrier rail.

605.02 MATERIALS

605.02.1 Concrete

Furnish Class Deck concrete in accordance with Section 551.

605.02.2 Reinforcing Steel

Furnish reinforcing steel in accordance with Section 555 and Subsection 711.01.

605.03 CONSTRUCTION REQUIREMENTS

605.03.1 Fabrication Submittals

Submit the following information to the Project Manager 10 business days prior to casting members:

1. A tentative fabrication schedule;
2. A mix design in accordance with Section 551;
3. The product data sheet for proposed cure and seal product.
4. Any other information necessary to fabricate and install the product.

Do not begin fabrication until the Department approved submittals are received by both the Contractor and the Project Manager.

Coordinate the fabrication schedule with the Project Manager.

605.03.2 Sampling, Handling, Batching, and Mixing

Sample, handle, batch, and mix materials for concrete in accordance with Subsection 551.03.3.

605.03.3 Forms and Forming

Meet the form requirements in Subsection 552.03.3.

605.03.4 Placing Concrete

Place concrete in accordance with Subsection 552.03.4 and 551.03.5.

605.03.5 Weather and Temperature Limitations.

Meet the requirements of Subsection 551.03.6 when constructing concrete barrier rail in hot or cold weather conditions.

605.03.6 Curing Concrete Barrier Rail

Cure concrete barrier rail in accordance with 551.03.7 using material in accordance with Subsection 717.01.4 requirements.

605.03.7 Testing and Acceptance of Concrete Barrier Rail

A. Sampling and Testing. Meet all requirements of Subsection 551.03.8(B).
B. Acceptance of Concrete Barrier Rail. Concrete Barrier Rail is evaluated on a lot-by-lot basis in accordance with 551.03.8(C) for Class Deck Concrete except for the following:
    1. An individual lot is defined as 30 concrete barrier rail units or one day’s production, whichever is less.
    2. A minimum of one standard compressive strength set will be made for each lot.

605.03.8 Form Removal

Remove lateral support forms only when it does not damage the concrete. Do not interrupt curing and protection in excess of 30 minutes for form removal. Replace all damaged units at Contractor expense.

605.03.9 Finish on Exposed Surfaces

Apply an ordinary finish to surfaces not smooth and uniform in texture and appearance in accordance with Subsection 552.03.11.

605.03.10 Handling, Transporting, and Storage

Include on each fabricated piece of barrier rail a permanent identification number representing the date fabricated and Lot number associated with that days pour. Place the number in the same location on each piece. The ID must be visible when the barrier rail is pinned and in place on the project.

The number may be cast into the concrete or attached after the curing period is complete. Numbers must be legible.

Notify the Department when forms will be stripped, and markings applied. All numbers must be verified by inspection within 48 hours of removal of forms. Track all barrier rail supplied to Department projects. Submit to the Project Manager the lots and identification numbers representing all barrier rail to be included for the project.

The concrete barrier rail may be moved from the casting area to an adjacent staging area when they have reached 75% of design strength and the strength is adequate to prevent damage. Replace all cracked or broken items at Contractor expense.

Handle, transport, and store precast concrete items without damage. Replace or repair all damaged units at Contractor expense. Transport the concrete barrier rail from their casting or adjacent staging location only after strength tests indicate the lot they represent has reached the design strength. If shipping is desired before the Department's 28-day acceptance tests are performed, supply compressive strength results representing the lot of concrete to the Department indicating design strength has been met. Ensure this testing is conducted by an ACI certified technician. Final acceptance of the concrete barrier rail will be based on the Department's test results for acceptance.

605.03.11 Install Concrete Barrier Rail

Install concrete barrier rail meeting the contract requirements and the Detailed Drawings.

605.03.12 Reset Concrete Barrier Rail

Reset concrete barrier rail as specified in the contract.

605.04 METHOD OF MEASUREMENT

605.04.1 Concrete Barrier Rail

Concrete barrier rail is measured by each 10-foot (3.05 m) section. Connections to the existing barriers are included in the cost of the rail.

Measurement does not include those portions of barrier constructed as an integral part of sign foundations.

605.04.2 Reset Concrete Barrier Rail

Reset concrete barrier rail is measured by each 10-foot (3.05 m) section.

605.04.3 Concrete Barrier Rail Transition

Concrete barrier rail transitions are measured by each 10-foot (3.05 m) section.

605.04.4 Concrete Barrier Rail Terminal Section

Concrete barrier rail terminal sections are measured by each 10-foot (3.05 m) section.

605.04.5 Remove Concrete Barrier Rail

Remove concrete barrier rail is measured by each 10-foot (3.05 m) section.

605.05 BASIS OF PAYMENT

Payment for the completed and accepted quantities is made under the following:

Pay Item	Pay Unit
Concrete Barrier Rail	Each
Concrete Barrier Rail Transition	Each
Concrete Barrier Rail Terminal Section	Each
Remove Concrete Barrier Rail	Each

Payment at the contract unit price is full compensation for all necessary resources to complete the item of work in accordance with the contract.

606 GUARDRAIL AND CONCRETE BARRIER RAIL Page 341 3-10-16

Rescind the title only of Section 606 and replace with the following:

SECTION 606
GUARDRAIL

606.01 DESCRIPTION Page 341 3-10-16

Rescind the first (only) paragraph (that begins, “The work is…) and replace with the following:

This work is the furnishing, installing, removing, resetting, replacing and revising metal beam guardrail, cable guardrail, and box beam guardrail.

606.02 MATERIALS Page 341 3-10-16

Rescind the first paragraph (that begins, “Furnish metal beam…) and replace with the following:

Furnish metal beam guardrail, cable guardrail, and box beam guardrail materials in accordance with the following section and subsection requirements:

Within the list of materials, rescind only the line shown below:

Concrete Barrier Rail 554

606.03.1 GENERAL Page 341 3-10-16

Within the first paragraph, rescind the first sentence (that begins, “Install guardrail and…) and replace with the following:

Install guardrail meeting the requirements of Detailed Drawings and the contract.

606.03.2 INSTALLING POSTS Page 342 12-11-14

Rescind the first paragraph (that begins, “If the posthole is…) and replace with the following:

Complete guardrail widening prior to new post installation.
Install posts in accordance with manufacturer recommendations. Drive posts unless conditions require excavation and backfilling. If the posthole is excavated, compact the posthole bottom, insert the post, and backfill and compact around the post in 6-inch (150 mm) loose layers ensuring the material is at optimum moisture before placing and compacting the next layer. Maintain the post line and grade.

Rescind the second paragraph (that begins, “Always drive steel …”).

606.03.3 METAL BEAM GUARDRAIL ERECTION Page 342 5-25-17

Within the first paragraph, rescind the second sentence (that begins, “Locate all rail…):

606.03.7 CONCRETE BARRIER RAIL Page 342 3-10-16

Rescind Subsection 606.03.7 and replace with the following:

606.03.7 Reserved

606.04.9 CONCRETE BARRIER RAIL Page 344 3-10-16

Rescind Subsection 606. 04.9 and replace with the following:

606.04.9 Reserved

606.04.12 CONCRETE BARRIER RAIL TRANSITION Page 344 3-10-16

Rescind Subsection 606. 04.12 and replace with the following:

606.04.12 Reserved

606.04.13 CONCRETE BARRIER RAIL TERMINAL SECTION Page 344 3-10-16

Rescind Subsection 606. 04.13 and replace with the following:

606.04.13 Reserved

606.04.16 REMOVE CONCRETE BARRIER RAIL Page 344 3-10-16

Rescind Subsection 606. 04.16 and replace with the following:

606.04.16 Reserved

606.05 BASIS OF PAYMENT Page 345 3-10-16

Remove the following pay items and units from the table:

Pay Item	Pay Unit
Concrete Barrier Rail	Each
Concrete Barrier Rail Terminal Section	Each
Concrete Barrier Rail Transition	Each
Remove Concrete Barrier Rail	Each

607.03.3(B) TOP RAIL OR CABLE Page 348 3-10-16

Rescind Subsection 607.03.3(B) and replace with the following:

B. o able or ail rnis a ⅜-inch (10 mm) diameter galvanized steel cable for the top brace. Pass the top cable through the line post tops, providing a continuous brace from end-to-end of each fence section.

Use a top rail in place of the top cable when fences are used in low speed residential applications. Join top rail sections using sleeve-type couplings. Fasten the top rails to the terminal posts using pressed steel fittings.

608.02 MATERIALS Page 353 7-14-16

Within the list of materials, rescind only the line rescind the line for Reinforcing Steel and replace with the following:

Reinforcing Steel 555 and 711.01

Rescind the second, third, and fourth (last) paragraphs of Subsection 608.02 and replace with the following:

Use cast iron DWDs having a natural grey finish. Use DWDs – Type 1 for new sidewalk construction. DWDs – Type 1 are cast directly into sidewalk. Use DWDs – Type 2 for retrofits on existing sidewalks. Ensure gray iron castings are manufactured from iron conforming to ASTM A48 Class 30B, as noted in AASHTO M 306. Ensure ductile iron castings are manufactured from iron conforming to ASTM A536 Grade 80-55-06

Furnish DWDs listed on the QPL.

608.03.3 DETECTABLE WARNING DEVICES Page 353 4-16-15

Rescind Subsection 608.03.3 and replace with the following:

608.03.3 Detectable Warning Devices

A. General. Install DWDs so they extend the full width of the ramp, and the edge of the dome panel is located no more than 6 inches (150 mm) from the back of curb. Ensure that DWD edges are flush with adjacent sidewalk without gap

or lip, with domes protruding above adjacent surfaces. If DWDs require cutting, locate non-factory edges on the exterior side of DWD installation.

B. Type 2. Saw cut from existing sidewalk the minimum area required to allow installation. Remove the old sidewalk full depth within the cut area. Place new concrete meeting Section 608 requirements, and install DWD in accordance with manufacturer recommendation.

608.04 METHOD OF MEASURMENT Page 353 4-16-15

Rescind the second paragraph of (that begins, “DWDs are measured…”) and replace with the following:

DWDs are measured by the square yard (m^2) installed and accepted. For Type 2 DWDs, removal of existing devices, concrete sawing and removal, and all new concrete is not measured separately for payment.

609.03.6 BITUMINOUS CURBS Page 356 12-11-14

Rescind Subsection 609.03.6 and replace with the following:

609.03.6 Reserved

610.02 MATERIALS Page 359 10-9-14

Add the following material to the existing table:

Weed Control Mat.....713.06

610.03.2 SEEDING, FERTILIZING, AND MULCHING Page 359 8-6-15

Add the following sentence to the end of Bullet (B) Seeding Season:

If contract time has been stopped awaiting the seeding season, contract time assessment will resume when the seeding begins or October 15th, whichever occurs first.

Add the following sentence to the end of Bullet (G) Composting:

Compost rates are dry weight equlivalent.

610.03.4 EROSION CONTROL BLANKET Page 362 2-26-15

Rescind the title of Subsection 610.03.4 and replace with the following:

610.03.4 Rolled Erosion Control Products

Within the first paragraph, rescind the first sentence (that begins, “Prepare, fertilize, and seed…”) and replace with the following:

Prepare, fertilize, and seed the rolled erosion control products areas before placement.

610.03.5 WEED CONTROL MAT Page 362 10-9-14

Add the following Subsection:

610.03.5 Weed Control Mat
Handle and place weed control mat following the manufacturer’s recommendations.

610.04.7 SOIL RETENTION BLANKET Page 363 2-26-15

Rescind Subsection 610.04.7 and replace with the following:

610.04.7 Rolled Erosion Control Products

Rolled Erosion Control Products is measured by the square yard (m^2) in place.

610.04.9 WEED CONTROL MAT Page 363 10-9-14

Add the following Subsection:

610.04.9 Weed Control Mat
Weed control mat is measured by the square yard (m^2) in place.

610.05 BASIS OF PAYMENT Page 363 2-26-15

Rescind and replace the pay item “Soil Retention Blanket” with “Rolled Erosion Control Products”

Add the following pay item and unit to the end of the existing table:

Pay Item	Pay Unit
Weed Control Mat	Square Yard (m^2)

611.02.1 CONCRETE Page 365 9-20-18

Rescind Subsection 611.02.1 and replace with the following:

611.02.1 Concrete
Furnish air-entrained hydraulic cement concrete in accordance with Section 551 for precast bases.

611.03.2 PLACING CONCRETE BASES Page 365 9-20-18

Rescind the first paragraph of Subsection 611.03.2 (that begins, “Construct poured-in-place…”)

612.03 CONSTRUCTION REQUIREMENTS Page 367 1-18-18

Prior to the first paragraph, add the following:

Paint all new structural steel surfaces, except those noted in Subsection 612.03.3(C)1. Do not paint weathering steel unless specifically stated.

612.03.3(C)(1) SHOP PAINT Page 369 10-9-14

Within the first paragraph, rescind the second sentence (that begins, “Do not paint…”) and replace with the following:

Do not paint surfaces in contact with other metal surfaces or concrete, except as noted in Subsection 612.03.5(A).

613.03.4 CONCRETE DRAINAGE CHUTES Page 374 10-9-14

Rescind Subsection 613.03.4 and replace with the following:

613.03.4 Drainage Chutes
Construct drainage chutes as shown in the Detailed Drawings.

617.03.11 SERVICE AND CONTROL ASSEMBLY Page 389 7-14-16

Within the second paragraph, rescind the fourth (last) sentence (that begins, “Include the cost…”) and replace with the following:

Include the cost of the 6 x 6 inch (150 x 150 mm) wood post, if necessary, as part of the service assembly bid item. Full length pressure-treat all S4S timber posts and poles in accordance with Subsection 706.04.

618.03.5 TRAFFIC CONTROL GENERAL REQUIREMENTS Page398 12-8-16

Rescind and replace the first paragraph with the following:

Meet all traffic control plan requirements before starting work affecting the roadway. Furnish and maintain traffic control devices that meet the “acceptable” category described in Quality Guidelines for Temporary Traffic Control Devices and Features published by ATSSA. Repair or remove and replace “marginal” devices with 24 hours; and repair or remove and replace “unacceptable” devices immediately. Anything in the worse-than-marginal conditions is not acceptable. Do not deliver devices in the “unacceptable” category to the jobsite.

618.03.8 TRAFFIC CONTROL AT DROP-OFF AREAS Page 436 *11-14-19

Rescind Table 618-4 and replace with the following:

TABLE 618-4

TRAFFIC CONTROL DEVICE BASED ON SPACING FACTOR

Spacing Factor	Device Type
400 feet (122 m) or greater	Flexible guideposts or standard delineators
20 to 390 feet (6 to 119 m)	Type 2 object marker
Less than 20 feet (6 m)	Positive barrier, if 48 hours lapses before filling

Rescind the last paragraph (that begins, “ Do not space..”).

618.03.12 TRAFFIC CONTROL FOR STRIPING OPERATIONS Page 402 10-9-14

Rescind Subsection 618.03.12 and replace with the following:

618.03.12 Traffic Control for Striping and Sweeping Operations

Provide the following traffic control for striping and final sweep and broom operations not performed under closed lane or pilot car situations.

1. Furnish and operate a shadow vehicle equipped with a truck or trailer-mounted attenuator in accordance with Subsection 618.02 conforming to appropriate test levels. Position the truck to follow within 150 to 1,000 feet (45 - 305 m) on pavement marking removal and application, and sweeping and brooming. When placing or removing traffic cones that protect the pavement markings, use a vehicle with a truck-mounted attenuator or follow with a shadow vehicle possessing a truck mounted attenuator.
2. Equip shadow vehicles with an arrow board facing rear-approaching traffic.
   a. On multiple-lane roadways, place the arrow board display in lane shift mode (sequential arrow mode).
   b. On two-lane two-way roadways, place the arrow board in a hazard warning mode not displaying the lane-shift mode
3. If peak hours are specified in the contract, provide the Project Manager a schedule of striping and final sweep and broom operations at least 48 hours prior to work. Perform work during off-peak hours in order to minimize impacts to the traveling public unless approved differently by the Project Manager.
4. For striping operations, include all costs associated with this work in the striping bid item.
5. If requested by the Project Manager, provide a WN identifying the proposed traffic control devices to be used for striping or final sweep and broom operations. If the Contractor and Project Manager agree that additional traffic control devices not listed in items 1 through 3 are warranted; the additional traffic control devices will be measured and paid in accordance with Subsections 618.04 and 618.05.

Failure to properly notify the Project Manager or provide adequate traffic control renders the striping or final sweep and broom operation unacceptable and unauthorized. Unacceptable or unauthorized work will be addressed in accordance with Subsection 105.12.

618.03.13 TRAFFIC CONTROL DEVICE LOCATION AND INSTALLATION Page 403 *11-14-19

Rescind the 12th paragraph (that begins, “Do not use flexible guide posts”).

Within the ‘Existing’ row of Table 618-5, replace ‘winter shutdown’ with ‘winter suspension’.

Within Table 618-5, rescind only the rows for 25, 35 and 45 mph and replace with the following:

45 mph	-Seal coat operations on interstates, increased to 55 mph once initial brooming roadway is completed. -Interstate roadways with construction activities on shoulders of a live lane.
35 mph	-Seal coat operations on two-lane two-way and multiple-lane two-way roadways, increased to 45 mph once initial brooming roadway completed. -In advance of flagging stations or temporary traffic signals. -Interstate and multiple-lane roadways with construction activities in closed lane(s), when workers are present. -Two-lane two-way roadways with construction activities on shoulders.
25 mph	-Temporary diversions on graveled surfaces. -Pilot car queues. -Survey crew activities within the traveled way. (non-interstate) -Two or multiple-lane roadways in an urban area with construction activity in a lane, when workers are present.

618.04 METHOD OF MEASUREMENT Page 406 12-8-16

Rescind and replace the second and third paragraphs with the following:

Signs and devices must meet the “acceptable” category outlined in Subsection 618.03.5 to be measured for payment. Failure to adequately maintain and clean traffic control devices in use renders the traffic control operation unacceptable.

The contractor, upon receiving written or verbal notification, will be given 24 hours to make the traffic control operation compliant. Traffic Control directly affecting the safety of the public must be attended to immediately. The Project Manager may apply deducts as shown below due to traffic control operations not meeting the requirements set forth in Section 618:

- 10% of the daily traffic control units;
- $250 per day for lump sum contracts.

618.05 BASIS OF PAYMENT Page 407 *11-14-19

Remove the following pay items and units from the table:

Temporary Pavement Markings Mile (km)

619.03.8 DELINEATORS Page 411 10-9-14

Add the following sentence to the end of the first paragraph (that begins, “Furnish and install new…):

Furnish and install snow poles, if required, in accordance with the Detailed Drawings.

619.04.4 DELINEATORS Page 412 10-9-14

Rescind the first paragraph (that begins, “Delineators of each...) and replace with the following:

Delineators of each type specified are measured by the unit and include the reflector, mounting hardware, post, and snow pole, if applicable, complete in place.

620.04.1 TEMPORARY STRIPING QUANTITIES Page 419 *11-14-19

Rescind the first paragraph (that begins, “ Temporary striping is…) and replace with:

Temporary striping is measured by the linear foot (m) to the nearest foot (0.1 m) of actual 4-inch (100 mm) stripe applied. Lines wider and narrower than 4 inches (100 mm) are converted to the equivalent linear feet (m) of 4-inch (100 mm) wide line.

620.05 BASIS OF PAYMENT Page 420 *11-14-19

Rescind the Pay Item/Pay Unit and replace with the following:

Temporary Striping Linear Foot (m)

622.03.3 SUBSURFACE DRAINAGE GEOTEXTILE FILTER Page 425 10-9-14

Within the fifth paragraph, rescind the second (last) sentence (that begins, “If a perforated…).

623.02 MATERIALS (MAILBOXES) Page 429 12-11-14

Within the first paragraph, rescind the first sentence (that begins, “Use mailboxes listed…) and replace with the following:

Use metal mailboxes listed on the QPL for Mailbox and Mailbox - Large.

701.01 AGGREGATES FOR CONCRETE Page 433 *11-14-19

Replace AASHTO T 17 with MT 121.

Replace MT 209 with AASHTO T 96.

Replace MT 215 with MT 122.

Add the following Sentence following the third paragraph:

Do not use recycled concrete aggregate unless specified in the contract.

701.01.1 FINE AGGREGATES FOR CONCRETE Page 433 4-25-19

Rescind Table 701-1 and replace with the following:

TABLE 701-1
LIMITS ON DELETERIOUS MATERIAL
IN FINE AGGREGATE

Material	Maximum % By Wt.
Clay lumps and friable particles (AASHTO T 112)	3.00

Within Part (E), replace AASHTO T 71 with MT 121.

701.01.2 COARSE AGGREGATES FOR CONCRETE Page 434 9-20-18

Rescind Table 701-3 and replace with the following:

TABLE 701-3
LIMITS ON DELETERIOUS SUBSTANCES
IN COARSE AGGREGATE

Substance	Maximum % By Wt.
Lightweight pieces in aggregate (AASHTO T 113)	3.00
Clay lumps and friable particles (AASHTO T 112)	3.00
Total lightweight pieces, clay lumps and friable particles	5.00
Thin or elongated aggregate having a length greater than five times average thickness.	15.00
Material passing the No. 200 (0.075 mm) sieve	1.00 [1]

Notes:1. In crushed aggregates, if the material finer than the No. 200 (0.075 mm) sieve consists of fracture dust essentially free from clay or shale, the maximum limit may be increased to 1.5%.

701.01.3 OPTIMIZED GRADATIONS FOR CONCRETE Page 436 4-25-19

Replace both references to MT 215 with MT 122.

701.02.1 GENERAL REQUIREMENTS Page 436 4-25-19

Following the first paragraph, rescind the list of test methods, and replace with the following:

Fracture..... AASHTO T 335
Liquid Limit, Plastic Limit, Plasticity Index..... AASHTO T 89 and AASHTO T 90
Micro-Deval..... AASHTO T 327
Sand Equivalent..... AASHTO T 176 [1]
Sieve Analysis for Fine and Coarse Aggregate..... MT 202
Sulfate Soundness..... AASHTO T 104 or ASTM C88
Wear Test ..... AASHTO T 96

Notes:

1. As determined by alternate method No. 2 using stock solution with formaldehyde.

701.02.4 CRUSHED BASE COURSE TYPE "A" Page 438 5-25-17

Add the following column for Grade 7A material to the existing Table 701-8:

Percentage By Weight Passing Square Mesh Sieves	
Sieve Size	Grade 7A
2-inch (50 mm)	
1½-inch (37.5 mm)	
¾-inch (19.0 mm)	100
⅜-inch (9.5 mm)	57-81
No. 4 (4.75 mm)	36-60
No. 40 (0.425 mm)	6-25
No. 200 (0.075 mm)	2-8

701.02.8 CRUSHED COVER AGGREGATE - COVER MATERIAL Page 440 3-10-16

Rescind Table 701-12 and replace with the following:

TABLE 701-12
TABLE OF GRADATIONS - COVER MATERIAL

Percentage By Weight Passing Square Mesh Sieves			
Sieve Size	Type 1	Type 2	Type 3
½-inch (12.5 mm)			100
⅜-inch (9.5 mm)	100	100	40-80
No. 4 (4.75 mm)	0-15	0-8	0-8
No. 200 (0.075 mm)	0-2	0-1	0-1

701.02.9 AGGREGATE FOR CTB Page 441 10-9-14

Within Table 701-13, rescind the 4-12 percent passing the No. 200 (0.075 mm) sieve, and replace with 2-12 percent passing the No. 200 (0.075 mm) sieve.

701.03.1 GENERAL REQUIREMENTS Page 441 4-25-19

Within Table 701-14, replace MT 209 with AASHTO T 96.

Within Table 701-14, replace MT 217 with AASHTO T 335.

Within Table 701-14, rescind row showing Sand equlivant, and replace with the following:

Sand equivalent (AASHTO T 176 [3])	45% min.

Rescind Note 3 and replace with the following:

3. As determined by alternate method No. 2 using stock solution with formaldehyde. RAP, RAS, and Hydrated Lime will be excluded from the JMF for Sand Equivalent testing purposes,

Rescind the second paragraph (that begins, “All aggreagte must…”) and replace with the following:

All aggregate must be non-plastic when tested in accordance with AASHTO T 89 and AASHTO T 90.

701.03.2 AGGREGATE FOR PLANT MIX SURFACING Page 443 5-25-17

Within Table 701-1 rescind t e 13 % ini for t e -inc ix and re lace wit 1 % ini for t e - inch mix.

Within Table 701-15, rescind the 65-78 range VFA% for the 0.3 to10 million EASLs and 1 illion s ranges, and replace with 65-80 range VFA% for both the 3 to1 illion s and 1 illion s ranges.

Within Table 701-1 rescind t e 1 % ini for t e ⅜-inc ix and re lace wit 1 % ini for t e ⅜- inch mix.

Following Table 701-15, add the following Note 3, referenceing bot t e % ange of t e 3 illion s and the ini of t e ⅜-inch max:

3. Mix Design value only. Meet the requirements of Table 701-18 during job mix production.

Within Table 701-16, rescind the column titled “Job Mix Tolerance”.

Rescind Table 701-17 and replace with the following:

TABLE 701-17
HAMBURG WHEEL TRACK REQUIREMENTS

PG Binder Grade	Water Bath Temperature
PG 58-XX	111 °F (44 °C)
PG 64-XX	122 °F (50 °C)
PG 70-XX	133 °F (56 °C)

Within Table 701-18, change the title of the column “Job Mix Tolerance” to “Job Mix Target Tolerance”.

Within Table 701-18, rescind the rows showing VMA and D/A requirements for non-commercial mix and replace with the following:

VMA	13.0 to 17.0	14.5 to 18.0	15.5 to 18.4	± 0.6	12.4 to 17.6	13.9 to 18.6	14.9 to 19.0
D/A [2]	0.6 to 1.4			±0.2	0.4 to 1.6		

Within Table 701-18, rescind the rows showing VMA and D/A requirements for commercial mix and replace with the following:

VMA	12.4 to 17.6	13.9 to 18.6	14.9 to 19.0	N/A	N/A
D/A	0.4 to 1.6			N/A	N/A

Following Table 701-18, rescind Note 3 and replace with the following:

3. Start-up job mix range only applies to production before initial target set. Job mix target tolerances do not apply to start up job mix range.

701.04.3 GRANULAR BEDDING MATERIAL Page 447 1-19-17

Rescind the first sentence and replace with the following:

Furnish granular bedding material in accordance with either of the following:

1. Table 701-4 No.2; or

2. ¾-inch material in accordance with Table 701-16, with a maximum of 10% passing the No. 4 sieve.

701.12 DIGOUT AND SUB-EX REPLACEMENT MATERIAL Page 449 12-8-16

Rescind Subsection 701.12 Digout and Sub-ex Replacement Material and replace with the following:

Furnish replacement material for digout and sub excavation areas consisting of a well-graded sand and gravel, free of organic and other deleterious material, meeting the AASHTO M 145 requirements for A-1-a group classification as amended by Table 701-24. Material in accordance with Subsection 701.02.4 may also be used as replacement material in either application. Any replacement material may consist of up to 50% RAP, uniformly blended. Crusher reject material may be used for either application provided it meets the requirements in Table 701-24.

TABLE 701-24
DIGOUT AND SUB EXCAVATION REPLACEMENT MATERIAL

Percentage By Weight Passing Square Mesh Sieves		
	Sieve size	Percent Passing
Digout	2-inch (50 mm)	100
	No. 200 (0.075 mm)	8 maximum
Sub excavation	6-inch (152 mm)	100
	No. 200 (0.075 mm)	8 maximum
Crusher Reject	2-inch (100 mm)	100
	No. 4 (4.75 mm)	0-50
	No. 40 (0.425 mm)	0-30
	No. 200 (0.075 mm)	8 maximum

702.01 BITUMINOUS MATERIALS Page 451 5-25-17

Within the List of materials, rescind only the line for Polymer-Modified Cationic Emulsified Asphalt and replace with the following:

Polymer-Modified Cationic Emulsified Asphalt AASHTO M 316

702.02 TESTING AND ACCEPTANCE Page 451 5-25-17

Rescind Table 702-3.

704.01.1 SHEET ALUMINUM Page 465 10-9-14

Within Table 704-1, rescind the third heading “Maximum Back Brace Spacing Thickness” and replace with the following:

Maximum Back Brace Spacing

704.01.6 TREATED WOOD POSTS AND POLES Page 467 7-14-16

Within the second paragraph, rescind the sixth (last) sentence (than begins, “Full length pressure-treat…”) and replace with the following:

Full length pressure-treat all timber posts and poles in accordance with Subsection 706.04, regardless of length.

704.01.10(A) GENERAL Page 468 10-9-14

Remove the following Traffic Control Rate Schedule Group Numbers from Table 704-3:

18 (sign panel), 23, and 28.

704.02.1 ALUMINUM SIGNS Page 469 10-9-14

Within the second paragraph, rescind the third sentence (than begins, “Coat in accordance…”) and replace with the following:

Coat in accordance with ASTM B921 or B449 Class 2, 10 to 35 milligrams thick per square foot (0.093 m^2).

707.01 CONCRETE JOINT FILLERS Page 475 12-11-14

Rescind the heading only (707.01 CONCRETE JOINT FILLERS) and replace with the following:

707.01 JOINT FILLERS

707.01.1 CONCRETE PAVEMENTS Page 475 5-25-17

Rescind Subsection 707.01.1 and replace with the following:

707.01.1 Pavement

A. Expansion Joint Filler. Furnish expansion joint filler Type II cork in accordance with AASHTO M 153.
B. Joint Sealing Material. Furnish sealing material for all types of pavement joints that is a hot-poured thermoplastic rubber or rubber asphalt compound in accordance with ASTM D6690 Type IV and having a resilience within the range from 30%-60%. Use ready-mixed, cold applied joint fillers for sealing concrete pavement joints only with the Project Manager's prior written approval.

708.03 PERFORATED CONCRETE PIPE Page 477 3-10-16

Rescind Subsection 708.03 and replace with the following:

708.03 RESERVED

708.05 PVC GRAVITY SEWER AND DRAIN PIPE Page 477 4-16-15

Rescind Subsections 708.05, 708.05.1, 708.05.2 and 708.05.3 and replace with the following:

708.05 PVC GRAVITY PIPE

Furnish PVC pipe in accordance with ASTM D1784, and produced by a continuous extrusion process employing a prime grade of unplasticized polyvinyl chloride. Ensure the grade used is highly resistant to hydrogen sulfide, sulfuric acid, gasoline, oil, detergents and other chemicals found in sewage and industrial wastes. Furnish perforated pipe in accordance with ASTM D2729.

Ensure each pipe length is marked with nominal size, PVC cell classification, ASTM designation and SDR, if applicable. Ensure pipe has a minimum SDR of 35.

With the exception of Schedule 40 or 80 PVC conduit, ensure each pipe length has a bell providing a watertight joint when jointing the bell and spigot with a rubber ring. Make joint using a rubber gasket compressed between the outer surface of the spigot and the inner surface of the bell. Ensure the joint is completely sealed by the gasket, providing a watertight joint under all service conditions, including expansion, contraction, settlement and pipe deformation. Assemble the rubber ring joint according to manufacturer recommendation.

708.05.1 Schedule 40 or 80 PVC Conduit

For non-electrical conduit, furnish schedule 40 or 80 PVC pipe.

708.05.2 PSM PVC Pipe

Furnish PSM PVC pipe 4-inch through 15-inch nominal diameter gravity pipe in accordance with ASTM D3034.

708.05.3 Large diameter PVC Pipe

Furnish large diameter PVC pipe 18-inch through 48-inch in accordance with ASTM F679.

708.05.4 Profile Wall PVC

Furnish corrugated exterior with smooth wall interior profile wall PVC gravity pipe 4-inch through 36-inch (100 - 900 mm) nominal diameter in accordance with ASTM F949.

708.06 PVC PRESSURE WATER PIPE Page 478 4-16-15

Rescind Subsections 708.06, 708.06.1 and 708.06.2 and replace with the following:

708.06 PVC PRESSURE PIPE

708.06.1 Pressurized Water Pipe

Furnish pressure PVC water pipe 4-inch through 12-inch (100 mm - 300 mm) nominal diameter in accordance with AWWA Specification C-900.

Furnish pressure PVC pipe 14-inch through 48-inch (350 mm-1200 mm) nominal diameter in accordance with AWWA Specification C-905.

Use DR 25 Class 165 pipe. Ensure pipe joints are bell and spigot and include an elastomeric gasket. Pipe sections must be marked with diameter, code designation, DR, pressure class, and AWWA specification.

708.06.2 Pressurized Sewer Pipe

Furnish pressure PVC sewer pipe in accordance with ASTM D2241.

710.03 POWDER COATING PREQUIALIFICATION AND CERTIFICATION Page 487 2-26-15

Within Table 710-7, replace the ASTM Designation for testing Thickness with D7091.

711.01.1 BAR REINFORCING Page 489 7-14-16

Rescind the second (last) paragraph (than begins, “The Project Manager…”) and replace with the following:

Furnish bar reinforcing from a source audited by the NTPEP Reinforcing Steel/Welded Wire Reinforcement Audit Program and listed on the QPL.

711.01.3 WIRE AND WIRE MESH Page 489 7-14-16

Rescind the third (last) paragraph (than begins, “Furnish bar mats …”) and replace with the following:

Furnish bar mats in accordance with AASHTO M 54. Furnish wire, wire mesh, and bar mats from a source audited by the NTPEP Reinforcing Steel/Welded Wire Reinforcement Audit Program and listed on the QPL.

711.06 HIGH TENSILE STRENGTH BOLTS Page 489 1-18-18

Rescind the first paragraph (than begins, “Furnish high strength…”) and replace with the following:

Furnish high strength bolts for structural steel joints in accordance with ASTM F3125 Grades A325 (Type 1 or 3), or A490 (Type 1 or 3) as specified in the contract.

Rescind Part (A) and replace with the following:

A. Tension Control Bolts. Meet the requirements of ASTM F3125 Grade F1852 when substituting tension control bolt assemblies for Grade A325 bolts. Meet the requirements of ASTM F3125 Grade F2280 when substituting tension control bolt assemblies for Grade A490 bolts.

Within Part (B), rescind Table 711-1 and replace with the following:

TABLE 711-1
HEAVY HEX NUTS

Bolt Type		Heavy Hex Nut ASTM A563
Grade A325	Type 1-plain	Grade C, C3, D, DH, DH3
	Type 1-galvanized	DH
	Type 3	Grade C3, DH3
Grade A490	Type 1	Grade DH, DH3
	Type 3	Grade DH3

Notes:
1. Plain heavy hex nuts Grades C, C3 and D must have a minimum hardness of 89 HRB.
2. A194 Grade 2H may be substituted for A563 Grade DH
3. When galvanized fasteners are specified, furnish assemblies manufactured and lubricated with a visible dye, so a visual check verifies the lubricant’s presence at installation.

Within Part (C), rescind the forst sentence (that begins, “Furnish washers…”) and replace with the following:

Furnish washers bolts in accordance with ASTM F436.

Rescind Part (E) and replace with the following:

E. Galvanized High Strength Bolts. Hot dip galvanize Grade A325 bolts and hardware in accordance with ASTM F2329. Hot dip galvanizing Grade A490 bolts is not allowed.

711.12.3 DRAINAGE STRUCTURE CASTINGS Page 491 8-10-17

Rescind the first (only) paragraph (than begins, “Furnish structural drainage…”) and replace with the following:

Furnish structural drainage castings in accordance with the Detailed Drawings and AASHTO M 306 - HS-20.

711.19 METRIC PLATE SUBSTITUTION Page 493 10-9-14

Rescind the first sentence of the first paragraph (than begins, “Define the requirements…”) and replace with the following:

Substituting standard inch-sized steel plate for metric steel plate is allowed.

713.01 WATER Page 499 5-25-17

Rescind the first paragraph (than begins, “Furnish water for…”) and replace with the following:

Furnish water for mixing and curing in accordance with AASHTO M 157, 4.1.4. Known potable water may be used without testing.

713.03 CHLORIDES Page 499 7-14-16

Within Part (A), rescind the second sentence (than begins, “Products will be…”) and replace with the following:

Products will be tested as received in accordance with MT 502.

Within Part (B), rescind the second sentence (than begins, “Products will be…”) and replace with the following:

1. Products will be tested as received in accordance with MT 502.

713.05 TOPSOIL Page 501 3-10-16

Rescind Parts 1, 2 and 3 following the second paragraph (that begins, “Meet the following…”) and replace with the following:

1. Soil pH between 5.5 and 8.0 or up to 8.5 if the exchangeable sodium is less than 10%;
2. Soil electrical conductivity less than 4.0 dS/m or up to 4.5 dS/m if the exchangeable sodium is less than 10%; and
3. Organic content between 2% and 10%. When landscape grade topsoil is specified, ensure organic content is between 5% and 10%.

Rescind the third (last) paragraph (that begins, “Topsoil is sampled…”) and replace with the following:

Topsoil is sampled and tested in accordance with MT 601.

713.06 RESERVED Page 501 10-9-14

Rescind Subsection 713.06 and replace with the following:

713.06 WEED CONTROL MAT

Furnish a machine woven weed control mat composed of synthetic polypropylene or polyolefin fibers. Meet the requirements in Table 713-9.

TABLE 713-9
WEED CONTROL MAT

Property	Value	Test Method
Average weight	minimum 4 oz/yd^2	ASTM D3776
Water permeability	10-15 gallons per min per square foot	ASTM D4491
UV stability (minimum % tensile retention)	70%	ASTM D4355 (2,500-hour exposure)
Grab tensile strength	Warp:90 lbs minimum Fill: 50 lbs minimum	ASTM D4632

713.12 ROLLED EROSION CONTROL PRODUCTS Page 503 1-18-18

Rescind Subsection 713.12 and replace with the following:

713.12 Rolled Erosion Control Products

Furnish rolled erosion control products listed on the Department's QPL, as specified in the contract and meeting the requirements of this Subsection. If required, furnish natural fiber netting or stitching consisting of woven 100% biodegradable natural fibers such as coir, jute or sisal. Furnish blankets designed to stabilize and hold previously applied mulch or compost on slopes as well as newly constructed stream banks and slopes.

Natural fiber netting is available in various fiber types, strengths, weights and mesh-opening sizes.

A. Erosion Control Blankets. Furnish 100% biodegradable products for all types.
   1. Short Term Blanket. An erosion control blanket composed of 100% straw or 100% excelsior.
   2. Long Term Blanket. An erosion control blanket composed of 70% straw and 30% coconut or 100% excelsior.
   3. High Performance Blanket. An erosion control blanket composed of 100% coconut or 100% excelsior.

B. Permanent Turf Reinforcement Mat.
   1. Synthetic Fiber Matrix. Furnish a web of mechanically bonded synthetic fibers that are entangled to form a strong and dimensionally stable mat. Place fibers between 2 or 3 high-strength, biaxially oriented nets mechanically bound together by stitching with polyolefin thread. The netting material must be resistant to biological, chemical, and ultra-violet degradation.
   2. Natural Fiber Matrix. Furnish a natural fiber matrix constructed of two or three nets of heavy-duty polypropylene, polyethylene or nylon. The internal matrix fiber is composed of a natural fiber such as curled wood, straw or coconut.

TABLE 713-4
ROLLED EROSION CONTROL

Type	Mass[1] (lbs/yd)	Tensile Strength – MD[2] (lbs/ft)	Min. Shear Strength (lbs/ft^2)
Short term	0.5	120	1.70 [3]
Long term	0.5	150	2.0 [3]
High performance	0.6	190	2.25 [3]
TRM – natural fiber matrix	0.8	500	10.0 [4]
TRM – synthetic fiber matrix	0.5	300	12.0 [4]

Notes:
1. Combined fiber matrix and netting
2. Machine direct
3. Minimum shear stress the rolled erosion control product (un-vegetated) can sustain without physical damage or excess erosion ½-inch soil loss) during a 30-minute flow event in accordance with ASTM D6460 or D7207.
4. ini s ear stress t e f ll egetated can s stain wit o t sical da age or excess erosion ½-inch soil loss) during a 30-minute flow event in accordance with ASTM D6460 or D7207.

713.13 COMPOST Page 504 10-9-14

Rescind the second paragraph (that begins, "Furnish compost in…") and replace with the following:

Furnish compost listed on the QPL and in accordance with Table 713-8.

714.03 TEMPORARY WATERBORNE TRAFFIC PAINT Page 507 7-14-16

Within Table 714-1, rescind the reference to MT 544 and replace with MT 548.

714.04 WATERBORNE TRAFFIC PAINT Page 507 7-14-16

Add the following sentence to the end of the first (only) paragraph:

Blue, red or black paint may be used without being NTPEP tested if the base paint is the same chemical composition as a NTPEP tested paint.

Within Table 714-2, rescind the references to MT 543, MT 544, MT 545 and MT 549 and replace all with MT 548.

Below Table 714-2, add the following note referring to the “Color” section of Table 714-2:

Note 1: Furnish black paint in accordance with color chip 37038 of Federal Standard 595B.

714.05 HIGH DURABILITY WATERBORNE TRAFFIC PAINT Page 508 7-14-16

Add the following sentence to the end of the first (only) paragraph:

Blue, red or black paint may be used without being NTPEP tested if the base paint is the same chemical composition as a NTPEP tested paint.

Within Table 714-3, rescind the references to MT 543, MT 544, MT 545 and MT 549 and replace all with MT 548.

Below Table 714-3, add the following note referring to the “Color” section of Table 714-3:

Note 1: Furnish black paint in accordance with color chip 37038 of Federal Standard 595B.

714.06 EPOXY OR OTHER POLYMERIC TRAFFIC PAINT Page 509 7-14-16

Add the following sentence to the end of the first (only) paragraph:

Blue, red or black paint may be used without being NTPEP tested if the base paint is the same chemical composition as a NTPEP tested paint.

Within Table 714-4, rescind the references to MT 543 and MT 544 and replace both with MT 548.

Below Table 714-4, add the following note referring to the “Color” section of Table 714-4:

Note 1: Furnish black paint in accordance with color chip 37038 of Federal Standard 595B.

714.08 REFLECTIVE GLASS BEADS Page 512 4-16-15

Rescind Subsection 714.08 and replace with the following:

714.08 REFLECTIVE GLASS BEADS

Furnish glass beads for reflectorizing traffic pavement markings in accordance with AASHTO M 247. Gradation and roundness will be determined in accordance with AASHTO PP 74. In the event of a dispute, ASTM D1274 will be used for gradation determination and ASTM D1155 will be used for roundness determination.

717.01.3 LIQUID MEMBRANE-FORMING CONCRETE CURING COMPOUNDS Page 519 9-20-18

Rescind Subsection 717.01.3 and replace with the following:

717.01.3 Liquid Membrane-Forming Concrete Curing Compounds

Furnish liquid membrane-forming compounds for curing concrete listed on the QPL and in accordance with ASTM C 309 Type 1-D, clear or translucent and containing a fugitive dye, or Type 2, white pigmented.

717.01.4 CONCRETE CURE AND SEAL COMPOUNDS Page 519 9-20-18

Add the following Subsection:

717.01.4 Concrete Cure and Seal Compounds

Furnish liquid cure and seal compounds for concrete listed on the QPL in accordance with ASTM C1315 Type 1, Class A. Furnish clear products.

717.01.5 WHITE POLYETHYLENE SHEETING Page 519 *11-14-19

Add the following Subsection:

717.01.5 White Polyethylene Sheeting

Furnish white, reflective, polyethylene sheeting material for curing concrete in accordance with ASTM C171.

717.02.2(C) DECK SEALANT SAND Page 519 10-9-14

Rescind Subsection 717.02.2(C) and replace with the following:

C. Deck Sealant Sand. Furnish sand for bridge deck crack sealing operations in accordance with manufacturer's recommendations.