# 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 9:00 a.m. on February 20, 2025. All bids will then be publicly opened, reviewed for correctness, and then publicly read.

Federal Aid Project(s):

NH - HSIP 57-5(56)247 Flowing Wells – East & West

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).

MONTANA DEPARTMENT OF TRANSPORTATION

Loran Frazier, Chairperson
Montana Transportation Commission

Christopher Dorrington
Director of Transportation

Contract No.02225
HB:BB:9726000ADV

MONTANA DEPARTMENT OF TRANSPORTATION
SCHEDULE OF ITEMS

CONTRACT ID: 02225

PROJECT:NH-HSIP 57-5(56)247 9726056000 FLOWING WELLS - EAST & WEST

SECTION: 0001 - GRADE, GRAVEL, CTB, PMS & STRUCTURES

| PROP LINE NO. | ITEM NUMBER | ITEM DESCRIPTION | UNIT OF MEASURE | QUANTITY |
|---|---|---|---|---|
| 0010 | 103000000 | TRAINING PROGRAM | HOUR | 1,000.00 |
| 0020 | 103500005 | ESCROW OF BID DOCUMENTS | LS | 1.00 |
| 0030 | 104030010 | MISCELLANEOUS WORK | UNIT | 20,000.00 |
| 0040 | 104030045 | MISCELLANEOUS ITEMS-EACH | EACH | 1.00 |
| 0050 | 108000000 | CRITICAL PATH SCHEDULE | LS | 1.00 |
| 0060 | 108000010 | STRUCTURE ANALYSIS | LS | 1.00 |
| 0070 | 109200005 | MOBILIZATION | LS | 1.00 |
| 0080 | 202020041 | REMOVE STRUCTURE | LS | 1.00 |
| 0090 | 203020100 | EXCAVATION-UNCLASSIFIED | CUYD | 738,211.00 |
| 0100 | 203020310 | SPECIAL BORROW-NEAT LINE | CUYD | 1,978.00 |
| 0110 | 203020380 | SPECIAL EMBANKMENT | CUYD | 932.00 |
| 0120 | 203080100 | TOPSOIL-SALVAGING AND PLACING | CUYD | 54,480.00 |
| 0130 | 208010150 | TEMPORARY EROSION CONTROL-LS | LS | 1.00 |
| 0140 | 208010200 | TEMPORARY EROSION CONTROL-FIXED | UNIT | 500.00 |
| 0150 | 208010486 | STREAMBED MATERIAL | CUYD | 58.00 |
| 0160 | 210020170 | TEST TRAILER-TRANSPORT,SETUP | MILE | 155.00 |
| 0170 | 301020254 | BRIDGE END BACKFILL-TYPE 3 | CUYD | 2,170.00 |
| 0180 | 301020268 | TRAFFIC GRAVEL | CUYD | 13,000.00 |
| 0190 | 301020340 | CRUSHED AGGREGATE COURSE | CUYD | 64,916.00 |
| 0200 | 301020450 | SPECIAL BACKFILL | CUYD | 5,280.00 |
| 0210 | 301020625 | AGGREGATE TREATMENT | SQYD | 164,110.00 |
| 0220 | 304010005 | BASE-CEMENT TREATED | CUYD | 23,086.00 |
| 0230 | 401020045 | PLANT MIX SURF-3/4 IN | TON | 30,709.00 |
| 0240 | 401020046 | PLANT MIX BIT SURF-MISC | TON | 309.00 |
| 0250 | 401020300 | HYDRATED LIME | TON | 434.00 |
| 0260 | 402020090 | ASPHALT BINDER PG 58H-34 | TON | 1,582.80 |
| 0270 | 402020315 | EMULSIFIED ASPHALT-TACK COAT | GAL | 16,437.00 |
| 0280 | 402020375 | EMULSIFIED ASPHALT CHFRS-2P | TON | 261.90 |
| 0290 | 409000000 | FINAL SWEEP AND BROOM | CRMI | 6.90 |
| 0300 | 409000010 | COVER-TYPE 1 | SQYD | 147,516.00 |

SECTION: 0001 - GRADE, GRAVEL, CTB, PMS & STRUCTURES

| PROP LINE NO. | ITEM NUMBER | ITEM DESCRIPTION | UNIT OF MEASURE | QUANTITY |
|---|---|---|---|---|
| 0310 | 411011130 | CENTERLINE RUMBLE STRIPS-TYPE 3 | MILE | 6.60 |
| 0320 | 411011135 | RUMBLE STRIPS | MILE | 13.20 |
| 0330 | 551020030 | CONCRETE-CLASS GENERAL | CUYD | 78.60 |
| 0340 | 551020035 | CONCRETE-CLASS STRUCTURE | CUYD | 185.30 |
| 0350 | 551020036 | CONCRETE-CLASS STRUCTURE LOW | CUYD | 500.90 |
| 0360 | 552010140 | TRANSVERSE DECK GROOVING | SQYD | 1,633.90 |
| 0370 | 553010152 | PRESTRESSED BEAM-TYPE MTS-45 | LNFT | 1,020.00 |
| 0380 | 553010157 | PRESTRESSED BEAM-TYPE MTS-63 | LNFT | 1,115.00 |
| 0390 | 555010100 | REINFORCING STEEL | LB | 23,636.00 |
| 0400 | 555010200 | REINFORCING STEEL-EPOXY COATED | LB | 112,260.00 |
| 0410 | 556010010 | STRUCTURAL STEEL - MISC | LS | 1.00 |
| 0420 | 557010051 | 42 IN OPEN RAIL-BR-CSC | LNFT | 873.60 |
| 0430 | 559010202 | RE-DRIVE TEST PILE | EACH | 4.00 |
| 0440 | 559040035 | DYNAMIC LOAD TEST | EACH | 4.00 |
| 0450 | 559050115 | FURN STEEL PILE-PIPE | LB | 147,459.00 |
| 0460 | 559060115 | DRIVE STEEL PILE | LNFT | 1,434.00 |
| 0470 | 559060200 | PILE CUTTING SHOE | EACH | 35.00 |
| 0480 | 603000050 | GRANULAR BEDDING MATERIAL | CUYD | 1,167.00 |
| 0490 | 603000060 | FOUNDATION MATERIAL | CUYD | 1,446.00 |
| 0500 | 603010040 | DRAINAGE PIPE 18 IN | LNFT | 856.00 |
| 0510 | 603010056 | DRAINAGE PIPE 30 IN | LNFT | 612.00 |
| 0520 | 603010064 | DRAINAGE PIPE 42 IN | LNFT | 688.00 |
| 0530 | 603010066 | DRAINAGE PIPE 36 IN | LNFT | 84.00 |
| 0540 | 603010068 | DRAINAGE PIPE 48 IN | LNFT | 526.00 |
| 0550 | 603010076 | DRAINAGE PIPE 60 IN | LNFT | 142.00 |
| 0560 | 603010080 | DRAINAGE PIPE 66 IN | LNFT | 146.00 |
| 0570 | 603010160 | DRAINAGE PIPE ARCH 30 IN EQ DIA | LNFT | 184.00 |
| 0580 | 603010197 | DRAINAGE PIPE ARCH 84 IN EQ DIA | LNFT | 118.00 |
| 0590 | 603012530 | RCP 18 IN | LNFT | 46.00 |
| 0600 | 603012769 | RCP 72 IN | LNFT | 278.00 |
| 0610 | 603012793 | RCP 90 IN | LNFT | 208.00 |
| 0620 | 603013235 | RCPA 48 IN EQ DIA | LNFT | 120.00 |
| 0630 | 603013359 | REIN CONC BOX 8 X 8 | LNFT | 216.00 |
| 0640 | 603013371 | REIN CONC BOX 9 X 9 | LNFT | 174.00 |
| 0650 | 603013396 | REIN CONC BOX 17 X 8 | LNFT | 150.00 |
| 0660 | 603015270 | EMBANKMENT PROTECTOR 18 IN | LNFT | 563.00 |

SECTION: 0001 - GRADE, GRAVEL, CTB, PMS & STRUCTURES

| PROP LINE NO. | ITEM NUMBER | ITEM DESCRIPTION | UNIT OF MEASURE | QUANTITY |
|---|---|---|---|---|
| 0670 | 603587020 | REMOVE PIPE CULVERT | LNFT | 2,410.80 |
| 0680 | 606010037 | MASH BOX BEAM TERMINAL - MBEAT | EACH | 8.00 |
| 0690 | 606010040 | GUARDRAIL-STEEL BOX BEAM | LNFT | 576.00 |
| 0700 | 606010269 | GRD RL-BOX BEAM/BR APP-SEC-TYPE 4 | EACH | 8.00 |
| 0710 | 606010385 | REMOVE GUARDRAIL | LNFT | 1,757.90 |
| 0720 | 606011518 | TEMPORARY IMPACT ATTENUATOR | EACH | 8.00 |
| 0730 | 607100147 | FARM FENCE-TYPE F2M-32 IN WW | LNFT | 35,734.00 |
| 0740 | 607100252 | FARM FENCE-TYPE F4M | LNFT | 12,765.00 |
| 0750 | 607100271 | FARM FENCE-TYPE F5W AND F5M | LNFT | 1,001.00 |
| 0760 | 607100281 | FARM FENCE-TYPE F5M | LNFT | 17,530.00 |
| 0770 | 607100362 | FARM FENCE-PANEL/SINGLE FM | EACH | 524.00 |
| 0780 | 607100385 | FARM FENCE-PANEL/DOUBLE FM | EACH | 80.00 |
| 0790 | 607100430 | FARM GATE-WIRE-TYPE G-2 | LNFT | 776.00 |
| 0800 | 607100551 | FENCE-TEMPORARY | LNFT | 1,107.00 |
| 0810 | 607100720 | DEADMAN | EACH | 68.00 |
| 0820 | 609010112 | CURB 4 IN-CONCRETE | LNFT | 338.00 |
| 0830 | 610100101 | SEEDING AREA NO 1 | ACRE | 145.90 |
| 0840 | 610100103 | SEEDING AREA NO 3 | ACRE | 25.30 |
| 0850 | 610100326 | FERTILIZING AREA NO 1 | ACRE | 145.90 |
| 0860 | 610100560 | RIPRAP REVEGETATION | SQYD | 3,541.00 |
| 0870 | 610100565 | EROSION CONTROL BLANKET-HIGH- | SQYD | 6,456.00 |
| 0880 | 611010200 | REMOVE CATTLE GUARD | EACH | 1.00 |
| 0890 | 613100040 | RIPRAP-CLASS 2 RANDOM | CUYD | 3,128.00 |
| 0900 | 613100085 | OUTLET APRON | SQYD | 251.00 |
| 0910 | 613300050 | BANK PROTECTION-TYPE 3 | CUYD | 21.10 |
| 0920 | 613520010 | VEGETATED CONCRETE BLOCK MAT | SQYD | 10,001.00 |
| 0930 | 618030005 | TRAFFIC CONTROL DEVICES CB | UNIT | 1,500,000.0 |
| 0940 | 618100001 | MOTORCYCLE ADVISORY SIGN | EACH | 3.00 |
| 0950 | 619010062 | SIGNS-ALUM SHEET INCR XI | SQFT | 341.50 |
| 0960 | 619010090 | SIGNS-ALUM REFL SHEET XI | SQFT | 260.90 |
| 0970 | 619010230 | REMOVE SIGN | EACH | 48.00 |
| 0980 | 619010240 | REMOVE SIGN-GUIDE | EACH | 6.00 |
| 0990 | 619010310 | POSTS-STEEL U SIGN | LB | 154.00 |
| 1000 | 619010320 | POSTS-STEEL STRUCTURAL SIGN | LB | 2,706.00 |
| 1010 | 619010480 | POLES-TREATED WOOD 4 IN | LNFT | 392.00 |
| 1020 | 619010490 | POLES-TREATED WOOD 5 IN | LNFT | 182.00 |

SECTION: 0001 - GRADE, GRAVEL, CTB, PMS & STRUCTURES

| PROP LINE NO. | ITEM NUMBER | ITEM DESCRIPTION | UNIT OF MEASURE | QUANTITY |
|---|---|---|---|---|
| 1030 | 619010724 | FRANG SIGN POST BKWY-S5 X 10 | EACH | 12.00 |
| 1040 | 619010726 | FRANG SIGN POST BKWY-W4 X 13 | EACH | 2.00 |
| 1050 | 619011090 | DELINEATOR TYPE 1 | EACH | 100.00 |
| 1060 | 620011105 | WORDS AND SYMBOLS-WHITE PAINT | GAL | 8.00 |
| 1070 | 620011260 | WORDS AND SYMBOLS-WHITE EPOXY | GAL | 6.00 |
| 1080 | 620012955 | TEMPORARY STRIPING | LNFT | 115,335.00 |
| 1090 | 620013000 | STRIPING-WHITE PAINT | GAL | 520.00 |
| 1100 | 620013960 | STRIPING-WHITE EPOXY | GAL | 347.00 |
| 1110 | 620014000 | STRIPING-YELLOW PAINT | GAL | 398.00 |
| 1120 | 620014960 | STRIPING-YELLOW EPOXY | GAL | 265.00 |
| 1130 | 622011043 | PERM EROSION CONTROL-HIGH SURV | SQYD | 4,214.00 |
| 1140 | 622011084 | GEOTEXTILE STABILIZATION | SQYD | 13,139.00 |
| 1150 | 623000155 | MAILBOX | EACH | 1.00 |

**TABLE OF CONTENTS**
**FEDERAL AID PROJECT(S) NH-HSIP 57-5(56)247**

# SPECIAL PROVISIONS

## FEDERAL AID PROJECT NO(S). NH-HSIP 57-5(56)247

(REVISED 1-09-25)

The following special provisions are hereby made part of the contract and supplement and/or supersede any sections of the Standard Specifications of 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 documents are hereby incorporated by reference into this contract:

- "Question and Answer Forum": https://www.mdt.mt.gov/business/contracting/qacurrent.shtml
- "Standard Specifications for Road and Bridge construction": https://www.mdt.mt.gov/other/webdata/external/const/specifications/2020/SPEC-BOOK/2025-SPEC-BOOK.pdf
- The most recent version of the Detailed Drawings: https://www.mdt.mt.gov/business/contracting/detailed_drawings.shtml
- The most recent version of the Materials Manual: https://www.mdt.mt.gov/other/webdata/external/materials/materials_manual/MDT-MATERIALS-MANUAL-010925-LETTING.pdf

The latest version of the Standard Specifications, Biannual updates, and revision summaries can be found at the following website: https://www.mdt.mt.gov/business/contracting/standard_specs.shtml

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 Friday before the bid letting at 3:00 p.m. Answers provided by the Department to the questions, clarifications, and notifications can be posted up to 5:00 p.m. on the day before the 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]

The Flowing Wells – East & West project includes the complete reconstruction of approximately 6.7 miles of Montana Highway 200 (MT-200) west of Brockway in Garfield and McCone Counties. The project begins approximately 1.8 miles west of the Flowing Wells Rest Area in Garfield County at reference post 246.8 and extends east for 6.7 miles ending about 14 miles west of Brockway in McCone County at reference post 253.5. The roadway will be reconstructed including 6 ft. wide shoulders, centerline and shoulder rumble strips, new drainage structures, signing and pavement markings.

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

The work begins on the effective date stated in the Notice to Proceed (NTP) and is to be completed in 250 Working Days. The NTP will be issued with an effective date of April 21, 2025.

3. SEQUENCE OF OPERATIONS

A. Traffic Control Plan. Provide traffic control and a traffic control plan according to Section 618.

B. General Requirements. This special provision outlines the basic sequencing strategy and any specific limitations required for this project's traffic control requirements. However, the basic strategy is not intended to cover every situation which may arise in the field as a result of the contractor's operations or otherwise. Cooperate with the Project Manager and adjust the traffic control as required to fit specific field conditions.

Ensure that all temporary traffic routing, unless otherwise noted, facilitates the movement of agricultural equipment. Ensure that all lane widths are a minimum of 12-feet (clear of channelization devices), unless otherwise noted, and include widened radii to accommodate turning movements where necessary.

C. Sequence of Operations. In addition to the requirements of Subsection 104.05, Maintenance of the Work, and Subsection 108.04, Limitation of Operations, schedule operations in a manner to provide the least amount of inconvenience possible to the traveling public, and comply with the following:

1) Maintain a smooth, drivable surface where traffic is present at all times.

2) Drainage structures may be installed prior to grading operations. In the event the bituminous material of the present traveled way is removed during the installation of the drainage structures, repair and maintain the disturbed area with a minimum of 0.20 feet of bituminous surfacing. Provide the traveling public with a safe and smooth riding surface at all times. The cost of maintaining the present traveled way is not paid for separately. Absorb the cost in the unit bid for other items in the contract.

3) Maintain a minimum hydraulic opening at all times when working on the new bridge opening and removing the old one at Timber Creek (RP 248.8). The minimum hydraulic opening for this site is either a 90-inch diameter temporary culvert or a trapezoidal channel with a 6 ft. bottom width, 2:1 or flatter side slopes, and a minimum low beam clearance of 6 ft. above the channel bottom for any temporary bridge structure. Set the channel or culvert invert at approximately the existing thalweg of the channel. Remove any temporary structure when no longer needed.

4) Maintain access at all times to the Flowing Wells Rest Area to accommodate travelers utilizing the Rest Area as well as for continuous operation of FWP's watercraft inspection site located within the rest area property.

5) Two miles may be opened to grading operations. Before grading has begun on the third mile, the placing of aggregate surfacing must be completed on the first mile. Before grading has begun on the fourth mile, the placement of aggregate surfacing must begin on the second mile. The above grading limits may be adjusted to fit field grading balances when deemed necessary by the Project Manager.

6) Grading limits may be extended one mile at a time by coordinated progression of the aggregate surfacing. When construction is adjacent to and does not disturb the existing roadway, the above stage requirements do not apply.

7) Coordinate work in the end of project connection with the adjacent project to facilitate efficient use of materials and to efficiently maintain traffic during construction. See End Project Connection special provision for more information.

8) Do not leave any segments of cement treated base exposed through the winter shutdown period. Provide a minimum of one lift of crushed aggregate course on top of any completed cement treated base sections if they will not be paved prior to winter shutdown. Maintenance of any gravel surface through winter shutdown remains the responsibility of the contractor.

D. Method of Measurement and Basis of Payment. All the work resulting from this special provision is covered under the respective items of the contract. Where work is specified and not distinctly covered by a unit quantity and price, that work is considered as incidental to

and absorbed in the various bid items of the contract and no separate payment will be made. Traffic Control will be measured and paid for in accordance with Section 618 of the Standard Specifications and the "Traffic Control Rate Schedule" found elsewhere in this bid package.

4. END PROJECT CONNECTION

The plans package includes a 0.35-mile-long paved connection at the end of the project to transition from the offset alignment back to the present traveled way. Do not construct this connection unless it is necessary for the routing of traffic back to the PTW at the completion of this project due to the adjacent West of Brockway – West project not having begun work in this area. Anticipate coordination of work in this connection with this adjacent construction project, which is scheduled to begin construction in the 2026 season, pending completion of all preconstruction activities and availability of funding. Only quantities necessary for the construction of this project's features, including any Connection area features, will be measured and paid for with this project.

5. CONTRACT DOCUMENTS [102] (REVISED 1-9-25)

The following documents are now available within the Contractors Reference Material on the Department's Contracting and Bidding webpage https://www.mdt.mt.gov/business/contracting/ :

1) Table of Contractor's Submittals. (Revised 3-7-24)
2) Traffic Control Rate Schedule (Revised 3-9-23)
3) Erosion Control Rates (Revised 1-09-25)

6. DISADVANTAGED BUSINESS ENTERPRISES (DBE) REQUIREMENTS [102] (REVISED 2-23-23)

The DBE goal for this contract is 0.00%. Use the AASHTOWare Project BidsTM 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 BidsTM 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/ess-dbe/.

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.

7. DBE USAGE [102] (REVISED 11-16-23 M)

Contract specific goals are not placed on contracts; however, the Department has an overall 6.3% 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 6.0% 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/ess-dbe/.

8. VOLUNTARY PRE-BID NETWORKING CONFERENCE [102] (REVISED 8-8-24 M)

A pre-bid networking conference was held at the following time and location: October 17, 2024, 3:00PM, 1006 S Haynes, Miles City, MT.

The pre-bid networking conference included a formal sign-in process that is the official record of attendance.

Attendance at this conference was voluntary. Contractors, subcontractors, and suppliers were encouraged to attend, but attendance is NOT required for bidders.

The contract time on this project will be increased by 10 working days for a working day contract or 10 calendar days for a completion date contract via change order if the Prime Contractor attends the voluntary pre-bid networking conference.

Representatives of the Department will describe projects in the Glendive District and answer questions. The pre-bid networking conferences are for information only. The Department is not bound by any statement or representation concerning conditions or description of the work given by Department employees or agents at the pre-bid networking conference. The answers to any questions raised are non-binding oral explanations or instructions and relying on them is solely at the Bidder's risk. Any project specific issues raised at the pre-bid networking conference must be posted on the Q&A to be considered an enforceable provision of the contract to be let.

9. LABOR REQUIREMENTS [102] (REVISED 9-19-24)

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).

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

10. TRAINING PROGRAM [102] (REVISED 7-15-21 M)

Provide on-the-job training for 2 trainees. For more information and requirements of the job training program, see Subsection 109.12.

11. NEW SUBCONTRACTORS [102] (ADDED 4-04-24)

The contract amount will be increased by a maximum of $10,000 via change order if the Prime Contractor uses a DBE or SBE certified firm that has not worked on a federal-aid MDT contract in the past three years. The incentive amount will be applied in accordance with the following table.

| Subcontract Amount | Added Contract Amount |
|---|---|
| ≤ $15,000 | $1,000 |
| $15,001-$50,000 | $2,500 |
| $50,001-$100,000 | $5,000 |
| ≥ $100,000 | $7,500 |

Note: The table is representative for one subcontract.

Payment will be made once the subcontract has been fully executed and will be paid under the bid item NEW DBE-SBE INCENTIVE.

12. SMALL BUSINESS ENTERPRISE (SBE) GOAL [102] (REVISED 6-6-24)

The Contractor must achieve at least 0.1% SBE participation through subcontracts for this contract. An on-line SBE Directory is available at: https://app.mdt.mt.gov/ess-dbe/ .

Use the AASHTOWare EBS to submit the SBE participation. SBE participation is entered on the "DBE/SBE" List" Tab in AASHTOWare Project Bids. If the contract does not have a project-specific goal, zero percent (0.00%) will be displayed in the "Disadvantaged Business Enterprise (DBE) and Small Business Enterprise (SBE) Requirements" Tab in AASHTOWare Project Bids.

Download the most recent SBE bin file and complete the SBE commitments in the EBS file. SBE companies approved after the project advertisement will not be listed in the advertised AASHTOWare Project Bids DBE.bin file. Submit requests for the Department to post an updated dbe.bin file in the Q & A Forum 7 calendar days prior to the bid opening if required to include SBE's added after advertisement.

The bid may be considered non-responsive if the bid does not contain SBE participation in the electronic bid submission. Inclusion of SBE participation in the Subcontractor Report and not in the electronic bid submission does not meet the requirements of this provision.

Do not terminate, replace, or perform work of the SBE firm selected without prior written approval from the Project Manager.

13. SMALL BUSINESS ENTERPRISES REQUIREMENTS [102] (ADDED 5-16-24)

Rescind "DBE requirements" and replace with "DBE and SBE requirements" within the following subsections:

1) 102.02 Contents of Bid Package.
2) 102.07 Bidding Requirements.
3) 102.08J Rejection of Bid Proposal.

14. 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.

15. BIDDER'S PROPOSED AGGREGATE SOURCE(S) [103] (REVISED 4-28-22)

No later than 7 calendar days after the date of bid-opening (the date of bid opening to count as the first full day), submit to ECCB form MDT-CON-106-02-3 in accordance with Subsection 103.11.

16. ESCROW OF BID DOCUMENTS [103] (REVISED 4-28-22)

Escrow of bid documents under 103.09 is required for this contract.

17. PARTNERING [105] (ADDED 1-11-24 M)

In accordance with Subsection 105.05.1, this contract requires Level II facilitation.

18. STEEL PRICE ADJUSTMENT [106] (REVISED 11-14-24)

In accordance with Subsection 106.09.1, the base price per pound of steel for this contract is: $1.05.

19. BUILD AMERICA, BUY AMERICA (BABA) [106] (REVISED 1-11-24)

Furnish construction materials manufactured in the United States. Construction materials include articles, materials, or supplies that are or consist primarily of:

- Non-ferrous metals.
- Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables).
- Glass (including optic glass).
- Fiber optic cable (including drop cable).
- Optical fiber.
- Lumber.
- Drywall, and
- Engineered wood.

Construction materials exclude cement and cementitious materials, aggregates including stone, sand, or gravel, or aggregate binding agents (e.g., asphalt binder) or additives (e.g., polymer modifiers and admixtures).

Manufacturing processes for the construction material must occur in the United States. Manufacturing processes for each of the bulleted construction materials above are defined in 2 CFR 184.6 and are summarized below.

a) Non-ferrous metals: Initial smelting or melting through final shaping, coating, and assembly.

b) Plastics: Initial combination of plastic, polymer based, or composite materials until item is in its final form.

c) Glass: Initial batching and melting, annealing, cooling, and cutting.

d) Fiber Optic Cable: Initial ribboning, buffering, and fiber stranding and jacketing.

e) Optical Fiber: Initial preform fabrication through completion of draw.

f) Lumber: Initial debarking, treatment, and planing.

g) Drywall: Initial blending of gypsum, cutting, and drying of sandwiched panels.

h) Engineered Wood: Initial combination of constituents until item is in its final form.

BABA preference applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to a project. It does not apply to tools, equipment, and supplies brought to the construction site and removed at or before the completion of the project (e.g., temporary aluminum scaffolding). Buy America preference does not apply to equipment and furnishings that are used at or within the finished infrastructure project but are not permanently affixed to the structure (e.g., movable chairs, desks, or computer equipment used at or within the project but are not integral or permanently affixed to a structure).

2 CFR 184 applies to all construction materials on projects receiving federal financial assistance funds. Submit Form MDT-MAT-407 “Manufacturer’s Certificate of Compliance” for every material identified as a construction material in the Department’s Materials Manual Section MT 601 furnished to the project. For all other materials, documentation will be required upon request. Do not incorporate construction materials into the project until all required documentation is submitted to the Department. Ensure that suppliers and manufacturers understand the BABA and contract requirements to supply the required documentation.

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 containing construction materials of foreign origin are grounds for removal and replacement at the contractor’s expense.

The Department has designated contract materials as “construction materials” by their respective 9-digit material codes in section MT 601 of the Montana Materials Manual. However, the Department recognizes there will be situations where a product or material may not fit the designation indicated in section MT 601. In these cases, submit documentation demonstrating or justifying the supplier or manufacturer’s position that their specific item has been misclassified to the Project Manager at least 10 business days in advance of installation. The Department, in conjunction with FHWA, will review the submitted documentation and decide as to how that specific product or material will be classified. These determinations will be final and will require the appropriate necessary documentation as defined above.

The US DOT has found that it is in the public interest to issue a waiver of BABA’s domestic preferences in certain situations. For Construction Materials, the domestic preference may be waived if the total value of non-compliant material is under $1,000,000 or 5% of the total applicable project costs, whichever is less. Submit actual individual material costs, minus manufacturing costs outside the defined manufacturing processes outlined above, along with justification in the form of invoices, bills of lading, or other appropriate documents to the Department if requesting the waiver.

The above waiver does not apply to iron and steel and the existing de minimis standard for iron and steel under 23 CFR 635.410(b)(4) continues to apply.

Projects with a total contract value of $500,000 or less are exempt from all domestic preference regulations including steel and iron.

20. CONSTRUCTION EQUIPMENT ON STRUCTURES [107] (REVISED 9-21-23)

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

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

1) 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.

1) For bridges having no posted load restrictions and no removal of deck concrete (not milled), provide 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 Section 61-10 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 significant debonding of the top mat of deck reinforcing steel. The Project Manager, in conjunction with the Bridge Bureau, will determine if significant debonding is present.

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 a Professional Engineer registered in Montana.

a) Engineering analysis. Clearly describe loading conditions and 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.

(1) Load Cases.

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

(b) 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.

(c) 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.

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

(a) 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. 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 lump sum bid for Structure Analysis. Exception: If a full engineering analysis is required as a result of top mat debonding alone (none of the other criteria listed under C.2 are met) then it will be considered extra work and considered for time extension under 108.07.5.

21. STATUS OF UTILITIES [108]

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.

| Company | Facility | Contact | Phone # |
|---|---|---|---|
| Mid-Rivers Communications | fiber optic & telephone cables | Radley Dempewolf radley.dempewolf@midrivers.coop | 406-687-3336 office 406-974-2491 cell |
| McCone Electric Co-op., Inc | Electrical transmission power lines | Clay Nagle cnagle@mcconeelectric.coop | 406-485-3430 office 406-974-3065 cell |

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

The following consultants performed work on the project.

- HDR
- DOWL

23. 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.

24. MOISTURE SENSITIVE SOILS [203] (REVISED 9-11-14)

A. Description. Subsurface investigation for this project indicates that subgrade and/or foundation soils located within the project limits are sensitive to changes in moisture content, and may cause construction difficulties. Use construction methods and equipment appropriate for moisture-sensitive soils.

B. Construction. Unless otherwise specified in the contract or by the Project Manager, limit the length of subgrade exposed to precipitation events to an amount that can be adequately sealed by the contractor within 30 minutes of the start of a precipitation event.

Many possibilities are available to facilitate construction and to achieve proper compaction of the subgrade or foundation soils in the project limits. The Department does not direct the use of any of them. However, in preparing bids, identify measures to address the identified conditions. Some possibilities to consider are:

1) Sealing the surface of all exposed subgrade/foundation by rolling with a smooth drum roller whenever work at a particular location is interrupted for 6 or more hours and at the end of each work day;

2) Grading and sloping the surface of all exposed subgrade/foundation to facilitate unimpeded surface drainage away from the work area; and/or,

3) Allowing soils to adequately dry (including after precipitation events) before attempting any type of construction work on the subgrade/foundation soils.

C. Method of Measurement and Basis of Payment. Include all costs for the method(s) chosen to effectively address construction on moisture sensitive soils in the bid item

for unclassified excavation/borrow. No additional compensation will be allowed or given for claimed increased costs to address that portion of the work addressed by this provision.

25. ENVIRONMENTAL SPECIFICATIONS [208] (ADDED 9-9-21M)

The Contractor is required to review and meet the specifications of the following subsections:

| | |
|---|---|
| Migratory Bird Treaty Act Compliance – Structures | Subsection 208.03.4A(2) |
| AIS Watercraft and Equipment Inspection | Subsection 208.03.2D |

26. STORM WATER PERMITTING REQUIREMENTS UNDER THE MT POLLUTANT DISCHARGE ELIMINATION SYSTEM (MPDES) [208] (REVISED 8-10-23)

A. Description. The 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 (General Permit) 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 NOI package includes a Notice of Intent, with a topographic map, a 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 and implement the SWPPP. Provide an electronic 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.

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) Furnish and install public signage as required by the General Permit. Include the cost of the required sign(s) in the Temporary Erosion Control Lump Sum bid item. 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 General 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 copies of all NOI Packages submitted to DEQ and confirmations for receipt of complete NOI Packages 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. Use DEQ's most current self-inspection form available online at: https://deq.mt.gov/files/Water/WQInfo/Documents/WPBForms/2023-Attachment-B-MTR100000.pdf. Provide a copy of all inspection reports to the Project Manager within 7 calendar days of the inspection.

Report potential noncompliance in accordance with applicable regulations, guidance, and permit conditions. Submit to the Project Manager within 7 calendar 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 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 and authorization is received from the Department. The Department may require that certain 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, the Department will notify the Contractor to begin the Permit Transfer Notification in DEQ FACTS. Once completed, provide verification that all fees have been paid and the permit is ready for transfer in DEQ FACTS. The Department is not liable for the completeness or accuracy of Contractor records completed prior to the permit transfer. Ensure permit conditions and responsibilities are met until confirmation of the transfer is received from DEQ. Defend and hold the Department 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.

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 an 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 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. 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 208-2 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.

27. CLEAN WATER ACT SECTION 404 PERMIT AND SECTION 401 CERTIFICATION

A. Description. This provision describes the project work that has been authorized under Sections 404 and 401 of the Clean Water Act (CWA) and the associated conditions that must be adhered to for compliance with CWA requirements.

B. Section 404 CWA Nationwide Permit 23 Description. The permanent features of this project are authorized under a US Army Corps of Engineers Nationwide Permit 23 – Approved Categorical Exclusions, (Army Corps File Number NWO-2024-01344).

1) The permit for this project authorizes the following project work to be performed within waters of the US.

a) Stream Impacts:

| Stream or Water-body | Approx. Project Station | Latitude, Longitude | Materials Below OHWM | Linear Feet | Permanent Impacts (acres) |
|---|---|---|---|---|---|
| Unnamed Trib. to Timber Creek | STA 1810+60 | 47.325641, -106.19692 | 144 yd³ - Foundation material<br>72 yd³ - Granular bedding material<br>255 yd² - Geotextile<br>150 ln ft - 17x8 Rienf. Conc. Box Culvert ( ~68 yd³± of Concrete) | 170.6 | 0.034 |
| Timber Creek | STA 1886+60 | 47.325601, -106.166393 | 261 yd³ - Special borrow<br>222 yd³ - Emb.+<br>773 yd² - Geotextile<br>7 yd² - Veg. conc. Block mat | 169.6 | 0.224 |

| Stream or Water-body | Approx. Project Station | Latitude, Longitude | Materials Below OHWM | Linear Feet | Permanent Impacts (acres) |
|---|---|---|---|---|---|
| Skull Creek | STA 1934+70 | 47.325562, -106.146781 | 3 yd³ - Excavation. This area will be restored back to original condition after the riprap is installed | 60 | 0.002 |
| Total: | | | | 400.2 feet | 0.26 acres |

b) Wetland Impacts:

| Wetland Name | Approx Project Station | Latitude, Longitude | Proposed Action | Permanently Impacted Area (acres) |
|---|---|---|---|---|
| Unnamed Trib. to Timber Creek/Wetland 1 | Sta. 1787+87 - Sta. 1792+80 | 47.32591, -106.20527 | Reconstruct Highway 200 on a new alignment with safer recovery slopes. | 0.473 |
| Unnamed Trib. to Timber Creek /Wetland 2 | Sta. 1809+50 - Sta. 1823+06 LT & RT | 47.32576, -106.19699 | Remove and replace timber bridge at STA 1810+75. Replace with reinforced concrete box (RCB) culvert at STA 1810+57. Inlet and outlet ditch grading. | 0.181 |
| Timber Creek/Wetland 3 | Sta. 1883+40 - Sta. 1891+87 LT & RT | 47.32542, -106.16626 | Remove existing timber bridge at STA 1886+30. Install new bridge at STA 1891+19. Restore the historic Timber Creek channel. | 0.334 |
| Skull Creek/Wetland 4 | Sta. 1934+00 - Sta. 1936+77 LT & RT | 47.32549, -106.14682 | Remove existing timber bridge at STA 1935+10. Install new bridge at STA 1934+88. | 0.032 |
| Cemetery Coulee/Wetland 5 | Sta. 2124+21 - Sta. 2125+15 LT & RT | 47.32533, -106.07020 | Remove existing timber bridge at STA 2124+67. Replace with RCB at STA 2124+75. Inlet and outlet ditch grading. | 0.203 |
| Total: | | | | 1.22 acres |

2) This authorization is valid until March 14, 2026

3) Obtain the Nationwide Permit 23 Fact Sheet that fully describes the Nationwide Permit 23 and lists the General Conditions that must be adhered to for this authorization to remain valid. Adhere to the General Conditions.

C. Section 404 CWA Nationwide Permit 33 Description. Obtain authorization for the temporary features of this project (e.g. work bridges, work pads, cofferdams, diversions, etc.) under US Army Corps of Engineers Nationwide Permit 33 – Temporary Construction, Access, and Dewatering.

1) Acquire an additional Section 404 Permit and 401 Certification authorization for temporary discharges that are:

a) Located within 100 feet of the water source in natural spring areas;

b) Within the boundaries of any Tribal Reservation or Tribal trust lands;

c) Within the following waterways and their impoundments: Kootenai River, Missouri River, Yellowstone River, Bitterroot River, Clark Fork River (tributary to the Columbia River), Flathead River, Flathead Lake, and Milk River; or,

d) Within Special River Management Zone of the Upper Yellowstone River.

Prepare and submit a joint application in accordance with Section 208.03.3. MDT is not responsible for delays caused by incomplete or inaccurate submittals by the Contractor.

2) For all other temporary discharges, submit a written description to the Project Manager detailing the temporary facilities planned for the project, along with the associated restoration plan. Allow 5 working days for the Project Manager to review the plan and confirm CWA 404 pre-construction notification is not required. For temporary discharges authorized under Nationwide Permit 33 without pre-construction notification, the authorization is valid until March 14, 2026.

3) Obtain the Nationwide Permit 33 Fact Sheet that fully describes the Nationwide Permit 33 and lists the General Conditions that must be adhered to for this authorization to remain valid. Adhere to the General Conditions.

D. CWA Section 404 Regional Conditions. Obtain the 2021 Nationwide Permits Regional Conditions, Omaha District, State of Montana, Effective February 25, 2022, that also apply to this project and must be adhered to for these authorizations to remain valid. Adhere to the Regional Conditions, including but not limited to the following:

1) Temporary fills in wetlands must be placed on a horizontal marker layer, such as fabric or certified weed-free straw, to delineate the pre-project ground elevation and facilitate complete fill removal and site restoration.

E. All erosion control blanket or fabric used in or adjacent to waters of the United States must be comprised of degradable material to ensure decomposition. Do not use material that includes stabilized netting or stabilized open mesh, as these products take a long time to degrade, and they can trap small animals, birds, amphibians and fish. This prohibition also applies to mesh materials used for wattles, rolled materials, and bank wraps. Erosion control blanket or fabrics that break down within 24 months are acceptable. Non- degradable blankets or fabric may be allowed on a case-specific basis if it will be buried beneath riprap or structures and it is not likely to be exposed. Non-degradable blanket or fabric that becomes exposed within waters of the United States must be removed. CWA Section 401 Water Quality Certification is granted for Nationwide Permit 23 by the Montana Department of Environmental Quality (DEQ), provided that certain general and special conditions are met.

1) Obtain the water quality certification requirements issued by DEQ on December 14, 2020. Adhere to those general and special conditions.

2) Notification in accordance with DEQ 401 Certification General Condition E.1 has been fulfilled by MDT.

F. Copies of the 2021 Nationwide Permit Fact Sheets for Nationwide Permits 23 and 33, the 2021 Nationwide Permit Regional Conditions for the State of Montana, and DEQ's 401 Water Quality Certification Requirements for the 2021 Nationwide Permits are available

upon request from Environmental Services or on the web at http://www.mdt.mt.gov/business/contracting/environmental/cwa.shtml .

Coordinate with the engineering project manager if you have questions regarding this authorization. Proposed changes to the permanent structures should be directed to the project manager for coordination with the District Project Development Engineer in the Environmental Services Bureau. Temporary facility permitting and/or general permit questions should be directed to the project manager for coordination with the District Environmental Engineering Specialist.

28. STREAM PROTECTION ACT 124 [107] [208]

A. Description. The proposed project has been authorized by Preconstruction Stream Protection Act (SPA) 124 No.: MDT-R6-05-2024, by Montana Fish, Wildlife, and Parks (FWP); provided the General and Special Conditions listed below are followed. This Preconstruction SPA 124 authorizes the permanent features to be constructed at the following locations:

| Location of Waterbody | Name of Waterbody |
|---|---|
| M.P. 247.368 | Unnamed Drainage to Timber Creek |
| M.P. 248.828 | Timber Creek (All sites) |
| M.P. 249.741 | Skull Creek |
| M.P. 252.960 | Cemetery Coulee |
| M.P. 253.333 | Unnamed Drainage to Cemetery Coulee |

B. General Conditions

1) Meet the specifications listed in Subsection 208.03.3.

2) Install and maintain Best Management Practices and temporary erosion control measures where appropriate to protect the waterbodies and adjacent areas listed in the table above. Conduct all work in a manner that minimizes turbidity and other disturbance to these areas.

All geotextile fabric and/or Turf Reinforcement Mat (TRM) used in association with rip rap protection at bridge abutments (i.e., on fill and cut slopes, beneath all riprap, etc.), must be 100% biodegradable. This will allow riparian vegetation to regrow in a timely manner, while also protecting reptiles, and other aquatic organisms such as fish and amphibians.

Limit the clearing of vegetation to only what is necessary for the construction of the project within all riparian areas. Restore temporary access routes and all other temporarily disturbed areas near and within all riparian areas to the original contours and conditions, prior to completing the reclamation, i.e., seeding, of the vegetation.

Obtain a temporary facility SPA 124 Permit/Authorization from FWP. This Preconstruction SPA 124 Permit/Authorization does not cover the construction of temporary facilities such as work bridges, work pads, cofferdams, temporary detours, diversions, etc. This authorization does not include removal and disposal of the existing structure, access to and from authorized locations, sequencing and construction methodology to construct authorized features, or any other unauthorized impacts affecting permitted drainages. These items, and any other items not covered here but potentially affecting a stream/river or its channel(s), must be permitted separately by the Contractor.

C. Special Conditions.

1) This authorization is valid for two years from the date of issuance (09/24/2024).

2) The proposed work exceeds the scope of the Programmatic Environmental Assessment for a FWP issued Water Quality Discharge Permit (318 Permit) therefore application to the Montana Department of Environmental Quality for 318 Permit is required.

Copies of the Preconstruction SPA 124 Authorization No.: MDT-R6-05-2024, are available upon request from Environmental Services.

Contact the Project Manager for coordination with the District Biologist on any questions regarding this authorization.

29. BRIDGE DEMOLITION NOTIFICATION

A. Description. Prior to demolition of structures in Montana, including highway bridges, a notification form is required to be submitted to the Montana DEQ Asbestos Control Program. The Montana Demolition Notification form MTACP02 is available through the program internet site at http://deq.mt.gov/Public/asbestos/Forms. Direct questions regarding this special to the construction Project Manager (PM).

1) An inspection of the bridge has been conducted in the planning stage of the project, including a review of as-built drawings and inspection photos for the bridge structures, and sampling of suspect materials. No asbestos containing materials have been identified. A copy of the asbestos inspection is available from the PM. Review the inspection, verify that the condition of materials on the bridge have not changed since the inspection and that the sample quantities and analytical methods conform to ARM 17.74.354, and certify the inspection with a licensed inspector prior to submitting the Demolition Notification Form.

B. Construction. Submit the completed form to DEQ and the project PM at least 10 days prior to commencement of any bridge demolition activities. Provide a copy of the notification acknowledgement to the PM upon receipt from the DEQ.

C. Measurement and Payment. Measurement and payment for the notification is included in other items.

30. RIPRAP REVEGETATION

A. Description. This work is the incorporation of infill material between riprap voids and revegetating material on riprap surfaces outside the vertical projection of the bridge.

B. Materials

1) Riprap infill material. Provide Filter Material No. 2, or native material of a similar gradation approved by the Project Manager.

2) Furnish topsoil meeting Subsection 713.05, in accordance with Subsection 610.03.1, or a locally obtained topsoil with less than 30% coarse fragments (>0.2 inch) by weight.

3) Rolled Erosion Control Blanket. Furnish Long Term Blanket from the Department's QPL. Use only 100% biodegradable blanket that does not contain polypropylene plastic.

4) Seed. Furnish the following seed mix. Use individual substitute species only if the recommended species is not available and substitution is approved by MDT's Reclamation Specialist.

| Reclamation Seed Mixture | | | Broadcast Seeding Rate | | |
|---|---|---|---|---|---|
| Scientific Name | Common Name | Variety | PLS/ sq.ft. | % of Mix | Pounds PLS/ Acre |
| *Elymus trachycaulus* | Slender wheatgrass | Pryor | 13 | 10 | 4.0 |
| *Elymus canadensis* | Canda wildrye | VNS | 11 | 8 | 4.0 |
| *Elymus lanceolatus* | Streambank wheatgrass | Sodar | 35 | 26 | 10.0 |
| *Nassella viridula* | Green needlegrass | Lodorm | 43 | 32 | 10.0 |
| *Elymus hoffmanii* | Hybrid wheatgrass | AC Saltlander | 31 | 24 | 10.0 |
| | | GRAND TOTAL | 133 | 100 | 38.0 |

C. Construction Requirements.

1) Fill the spaces and voids between the rocks with riprap infill material. Place a sufficient amount of material over the riprap, so that after settling, the level of filter material comes to the very top of the rock.

2) Place the topsoil to a 6-inch depth over the infill material outside the vertical projection of the bridge. Place material in a manner that creates a smooth, uniform surface for seeding.

3) Hand broadcast seed immediately after soil placement, regardless of time of year, with the seed mixture and rates listed. Scarify, harrow or rake the soil immediately prior to and following seeding to incorporate seed to a depth of ¼ to ½ inch into the soil.

4) Install the long-term erosion control blanket immediately following broadcast seeding and scarification as shown in the plan details. Secure blanket with 12-inch wooden stakes per manufacturer spacing recommendation.

C. Method of Measurement and Basis of Payment. The infill material, topsoil placement, erosion blanket/mulch, and seeding are measured and paid for as RIPRAP REVEGETATION at the contract unit bid price per square yard.

31. INCREASE IN TURBIDITY [208] (REVISED 10-8-15)

A. Description. Montana Fish, Wildlife and Parks (FWP) has determined that this project may cause a significant increase in turbidity.

B. Requirement. Contact the Department of Environmental Quality (DEQ) to determine narrative conditions required to meet short-term (318 Authorization) water quality standards and protect aquatic biota.

1) Complete and submit the Joint Application for Proposed Work in Montana's Streams, Wetlands, Floodplains, and Other Water Bodies (Application Revised 6-5-2015) and all required attachments, according to the applications instructions. Form can be down loaded from: http://dnrc.mt.gov/licenses-and-permits/stream-permitting.

2) Application fees are the responsibility of the Contractor.

3) Do not begin any work that will affect a Montana stream, wetland, floodplain, and/or other water body until a valid 318 Authorization is received from DEQ. Other permits/authorizations may also be required for the proposed work.

C. Basis of payment. Include the cost to obtain this permit in the mobilization bid item.

32. SETTLEMENT WAITING PERIOD (REVISED 2-3-2022)

A. Description. Settlement waiting periods are required for embankment construction locations at the locations shown below:

Embankment Waiting Period Limits

| Station Range | Recommended Waiting Period for Establishment of Finish Grading and Paving |
|---|---|
| 1850+00 1860+00 | 60 days |
| 1914+00 to 1941+00 | 60 days |
| 1978+00 to 1986+00 | 60 days |
| 2005+00 to 2018+00 | 60 days |
| 2030+00 to 2050+00 | 60 days |
| 2077+00 to 2088+00 | 60 days |
| 2099+00 to 2132+00 | 60 days |

B. Construction.

1) Construct the embankments to the design subgrade elevation as shown in the plans.

2) After constructing the embankments to the design subgrade elevation, suspend grading operations for the specified time periods.

3) Contract Time will not be suspended if other road work continues elsewhere on the project.

4) Upon approval by the Project Manager, continue remaining embankment construction.

5) Regrade embankments or place additional embankment as necessary to compensate for any settlement before placing pavement section. Settlement ranging from 4 to 10.5 inches should be anticipated.

C. Method of Measurement and Basis of Payment. This work is not measured for payment, include all associated costs in other bid items.

33. EMBANKMENT FOUNDATION TREATMENT (REVISED 2-2-2022)

A. Description. This work consists of constructing an embankment foundation treatment consisting of Geotextile and Special Embankment in conformity to the lines and grades shown on the plans or as directed by the Project Manager.

B. Materials.

1) Provide Stabilization Geotextile meeting the requirements of Section 716.

2) Provide Special Embankment meeting the requirements of the Special Embankment Special Provision.

C. Construction Requirements.

1) In the area of embankment placement, cut all vegetation greater than 1 inch in diameter flush with the ground and remove. Otherwise, do not disturb existing vegetation/vegetative root mat.

2) Place geotextile over the embankment subgrade area, up the embankment side slopes and over Special Embankment as shown on the plans and cross sections and in conformance with Subsection 622.03. Overlap the adjoining edges of the geotextile a minimum of 3 feet with the edge of the upgrade sheet over the edge of the downgrade sheet.

3) Place the first 16 inches of Special Embankment over the geotextile without any specific compaction effort and with the least amount of equipment traffic possible, and otherwise in accordance with Subsection 622.03.

4) Place the second lift of Special Embankment in a single lift of 8 inch loose thickness and compact to a minimum 90% of the maximum dry density, as determined by MT 230.

5) Place subsequent lifts of Special Embankment in accordance with Subsection 203.03.3.

D. Method of Measurement.

1) Special Embankment is measured by volume in cubic yards calculated from the plan dimensions, or as ordered in writing by the Project Manager. There is no allowance for shrink, swell, compaction, waste, or other adjustment.

2) Geotextile is measured in accordance with Subsection 622.04.

E. Basis of Payment. Payment is full compensation for all labor, tools, equipment and other incidentals necessary to complete the work in accordance with the specifications and as directed by the Project Manager.

1) Special Embankment is paid for at the contract unit price in cubic yards. Include all costs associated with furnishing and placing Special Embankment in the unit bid price.

2) Geotextile is paid for in accordance with Subsection 622.05.

34. SPECIAL EMBANKMENT

A. Description. Place Special Embankment at the locations shown in the plans, cross sections, or as directed by the Project Manager.

B. Materials. Provide material for Special Embankment 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, with 100% passing the 6 inch sieve and a maximum of 8% by weight passing the number #200 sieve.

C. Construction. Compact Special Embankment in accordance with Section 203.

D. Method of Measurement. Special Embankment is measured by volume in cubic yards calculated from the plan dimensions, or as ordered in writing by the Project Manager. There is no allowance for shrink, swell, compaction, waste, or other adjustment.

E. Basis of Payment. Special Embankment is paid for at the contract unit price in cubic yards. Include all costs associated with furnishing and placing Special Embankment in the unit bid price.

35. SPECIAL BORROW (REVISED 12-11-15)

A. Description. Place special borrow at the locations shown in the plans, cross sections, or as directed by the Project Manager.

B. Materials. Provide material for special borrow consisting of a well-graded sand, silty sand, and gravel, free of organic and other deleterious material, meeting the AASHTO M 145 requirements for A-2-4 or better group classification, with 100% passing the 3 inch sieve.

C. Construction. Compact special borrow in accordance with Section 203.

D. Method of Measurement. Special borrow is measured in accordance with Subsection 203.04.

E. Basis of Payment. Special Borrow is paid in accordance with Subsection 203.05.

36. CULVERT FOUNDATION TREATMENT (REVISED 2-2-2022)

A. Description. Prior to culvert placement, construct the culvert foundation, consisting of culvert excavation, geotextile placement, and foundation material placement at the locations shown in the plans or as directed by the Project Manager.

B. Materials.

1) Provide Stabilization Geotextile meeting the requirements of Section 716.

2) Provide Culvert Foundation Material with a maximum of 15% passing the #200 sieve in addition to the requirements of Subsection 701.04.2.

C. Construction.

1) Excavate a zone as shown elsewhere in the Contract and 2.0 feet below the bottom of the planned bedding elevation.

2) Place geotextile as shown elsewhere in the Contract or as directed by the Project Manager. Overlap any adjoining edges of the geotextile a minimum of 3.0 feet with the edge of the upgrade sheet over the edge of the downgrade sheet.

3) Place the first 16 inches of Foundation Material over the geotextile with minimal compaction effort necessary to create a stable base, with the least amount of equipment traffic possible, and otherwise in accordance with Subsection 622.03.

4) Do not use vibratory, studded, or sheepsfoot rollers on the first 16 inches.

5) Place subsequent lifts in accordance with Subsection 622.03.

D. Method of Measurement.

1) Culvert Foundation Material is measured in accordance with Subsection 603.04.

2) Geotextile is measured in accordance with Subsection 622.04.

E. Basis of Payment. Payment is full compensation for all labor, tools, equipment and other incidentals necessary to complete the work in accordance with the specifications and as directed by the Project Manager.

1) Culvert Foundation Material is paid in accordance with Subsection 603.05.

2) Geotextile is paid in accordance with Subsection 622.05.

37. SPECIAL BACKFILL FOR CULVERTS (REVISED 2-2-2022)

A. Description. Place special backfill at the locations shown on the project plans and cross sections. Place special backfill to the bottom of the crushed aggregate course section or as shown in the plans.

B. Materials. Provide material for culvert backfill meeting the requirements of the Special Borrow Special Provision.

C. Construction. Compact Special Backfill in accordance with Section 203, limiting the lift thickness to 6 inches.

D. Method of Measurement. Special Backfill is measured by the cubic yard in place.

E. Basis of Payment. Special Backfill is paid at the contract unit price bid per cubic yard complete and in place.

38. DEWATERING AND DIVERSION (REVISED 12-11-15)

A. Description. Groundwater may be encountered when excavating for box culverts, pipes, and other drainage structures. Review the project irrigation practices and soil boring logs and make appropriate provisions for groundwater and necessary dewatering. Project borings indicate that groundwater may be encountered at shallow depths. However, groundwater levels can fluctuate yearly, seasonally, during precipitation events, or due to other factors. All excavations that encounter groundwater need to be dewatered properly and kept dry at all times.

B. Submittals. Prior to starting excavation for any box culvert, pipes, or other drainage structure, submit a dewatering plan to the Project Manager. The dewatering plan must include the number, size, and proposed location of pumps and sumps that will be used to dewater the excavation as well as copies of all applicable permits. Allow 5 working days for the Project Manager to review the dewatering plan.

C. Construction. When groundwater is encountered in excavations provide dewatering methods that will allow placement and compaction of backfill. Dewater the excavation to maintain conditions that allow for proper compaction of foundation materials and bedding in accordance with the requirements of the Contract. Do not allow the excavation to fill with surface water or groundwater at any time.

D. Method of Measurement and Basis of Payment. Dewatering is measured and paid for as Miscellaneous Work in accordance with Subsection 109.04.

39. COAL WASTE

A. Description. During the subsurface investigation, coal was encountered within the construction limits at or near subgrade elevation. This work is the removal and disposal of any coal found within the roadway excavation. Coal may be encountered between, but not limited to, the following area:

- 1835+50 to 1840+50, full width

B. Construction.

1) Coal at Subgrade. If coal is encountered at subgrade elevation, subexcavate a minimum of 2 feet below subgrade elevation by the width of the surfacing section, or down to inorganic soils or bedrock, whichever is less. Backfill the subexcavated area with non-coal native material, place and compact in accordance with Section 203.

2) Coal Waste. Waste all coal encountered in excavation on construction fill slopes or other suitable locations approved by the Project Manager. Coal may not be wasted in drainages. Cover wasted coal with a minimum of 1 foot of excavated material including placement of topsoil.

C. Method of Measurement.

1) Excavation below subgrade for coal is measured by the cubic yard in accordance with Subsection 203.04.

2) No separate measurement will be made for wasting coal, as outlined above, including haul and placement.

D. Basis of Payment.

1) Accepted quantities of excavation below subgrade for coal are paid at the contract unit price for Unclassified Excavation in accordance with Section 203.

2) Include all costs associated with wasting coal in the contract unit price for Unclassified Excavation. Payment at the contract unit price is full compensation to complete the items of work under the contract.

40. VEGETATED CONCRETE BLOCK MAT

A. Description. Vegetated Concrete Block Mat is manufactured from individual concrete blocks tied together with high strength knitted polypropylene bi-axial geogrid and a triple layer underlayment. Each block is tapered, beveled, and interlocked, and includes connections that prevent lateral displacement of the blocks within the mats when they are lifted for placement. Furnish and place the Vegetated Concrete Block Mat system in accordance with this specification and conforming with the lines, grades, design, and dimensions shown on the plans.

B. Materials. Use a tied Vegetated Concrete Block Mat with a Triple Layer Underlayment, consisting of Leno Weave, Recyclex TRM, and Curlex II Wood Excelsior. Provide Flexamat Plus or approved equal to meet the following specification requirements:

1) Concrete Blocks. Furnish blocks manufactured with concrete conforming to the cement requirements of ASTM C150 and to the aggregate requirements of ASTM C33. Meet a minimum compressive strength of 5,000 psi at 28 days. Furnish blocks that have a minimum weight of 3lb per block. Blocks to be placed no further than 2 inches apart.

2) Polypropylene Bi-Axial Geogrid. Provide revetment mat that is constructed of an interlocking geogrid comprised of an open knitted fabric composed of high tenacity, multifilament polypropylene yarns knitted and coated in tension with an acrylic based coating which is designed to resist degradation in environments with exposure to water and low pH (<4 pH) and high pH (>9 pH). When combined with the revetment mat, this will yield a high tenacity, low elongating, and continuous filament polypropylene geogrid that is embedded within the base of the concrete blocks. Ensure the geogrid meets the requirements of Table 1:

Table 1- Polypropylene Bi-Axial Geogrid.

| Property | Units | Test | Requirement (1,2) |
|---|---|---|---|
| Mass/Unit Area | $oz/yd^2$ | ASTM D5261 | 6.5 |
| Aperture Size | in | Measured | 1.4 x 1.4 |
| Ultimate Wide Width Tensile Strength (MD x CMD) | lb/ft | ASTM D6637 | 2,055 |

| | | | |
|---|---|---|---|
| Elongation at Ultimate Tensile Strength (MD x CMD) | % | ASTM D6637 | 6 |
| Wide Width Tensile Strength @ 2% (MD x CMD) | lb/ft | ASTM D6637 | 822 |
| Wide Width Tensile Strength @ 5% (MD x CMD) | lb/ft | ASTM D6637 | 1,640 |
| Tensile Modulus @ 2% (MD x CMD) | lb/ft | ASTM D6637 | 41,100 |
| Tensile Modulus @ 5% (MD x CMD) | lb/ft | ASTM D6637 | 32,800 |
| UV Stabilization (Carbon Black by Weight) | % | BS 2782:Part 4 Method 452B | > 0.8 |

Notes:

[1]Minimum average roll values (MARV), except Aperture Size is nominal dimension.

[2]Minimum strength direction.

3) Underlayment Materials. The triple layer underlayment material will be packaged as part of the roll of concrete block mat. The underlayment material is two types of erosion control blanket (ECB) and a turf reinforcement mat (TRM).

a) The top layer of erosion control blanket is a five pick Leno Weave to provide strength and support to the lower underlayment matrix. Ensure the top layer of erosion control blanket meets the requirements of Table 2:

Table 2 – Top Layer of Underlayment (Erosion Control Blanket).

| Property | Units | Requirement |
|---|---|---|
| GSM | $g/m^2$ | 118 |
| Density | Picks /10cm | 62 x 24 (+/-2) |
| Wrap Strength | N / 5cm | ≥ 350 |
| Wrap Elongation | % | 20 - 50 |
| Wrap Shrinkage | % | ≤ 7 |
| Weft Strength | N / 5cm | ≥ 280 |
| Weft Elongation | % | 20 - 50 |
| Weft Shrinkage | % | ≤ 9 |

b) The middle layer of turf reinforcement mat is a permanent non-degradable TRM consisting of 100% post-consumer recycled polyester with 80% five-inch or greater fiber lengths. It is of consistent thickness with fibers evenly distributed throughout the entire area of the TRM. The top and bottom of the TRM is covered with heavy duty polypropylene net. Fibers are tightly crimped and curled to allow fiber interlock, and to retain 95% memory of the original shape after loading by hydraulic events. Fibers have a specific gravity greater than 1.0. Ensure the middle layer of turf reinforcement mat meets the requirements of Table 3:

Table 3 – Middle Layer of Underlayment (Turf Reinforcement Mat).

| Property | Units | Test Method | Requirement (1,2) |
|---|---|---|---|
| Thickness | in | ASTM D 6525 | 0.29 |
| Light Penetration | % | ASTM D 6567 | 57 |
| Resiliency | % | ASTM D 6524 | 86 |
| Mass per Unit Area | $lb/yd^2$ | ASTM D 6566 | 0.5 |

| | | | |
|---|---|---|---|
| MD-Tensile Strength Max. | lb/ft | ASTM D 6818 | 295 |
| TD-Tensile Strength Max. | lb/ft | ASTM D 6818 | 194 |
| MD-Elongation | % | ASTM D 6818 | 32 |
| TD-Elongation | % | ASTM D 6818 | 41 |
| Swell | % | ECTC Procedure | 8 |
| Water Absorption | % | ASTM D 1117 / ECTC | 34 |
| Specific Gravity | ~ | ASTM D 792 | 1.21 |
| UV Stability | % min. @ 1000hrs | ASTM D 4355 | 80 |
| Porosity | % | Calculated | 97.5 |
| Bench-Scale Rain Splash | @ 2 in/hr | ECTC Method 2 | SLR = 5.9 (1,2) |
| Bench-Scale Rain Splash | @ 4 in/hr | ECTC Method 2 | SLR = 5.0 (1,2) |
| Bench-Scale Rain Splash | @ 6 in/hr | ECTC Method 2 | SLR = 6.3 (1,2) |
| Bench-Scale Shear | $lb/ft^2$ @ ½ in of soil loss | ECTC Method 3 | 2.4 (2) |
| Germination Improvement | % | ECTC Method 4 | 430 |

Notes:

[1] SLR is the Soil Loss Ratio, as reported by NTPEP/AASHTO.

[2] Bench-scale index values should not be used for design purposes.

c) The bottom layer of erosion control blanket is a naturally seed free Great Lakes Aspen curled wood excelsior with 80% six-inch or greater fiber lengths. It is of consistent thickness with fibers evenly distributed throughout the entire area of the blanket. The top and bottom of each wood excelsior is covered with degradable polypropylene netting. Ensure the bottom layer of erosion control blanket meets the requirements of Table 4:

Table 4 – Bottom Layer of Underlayment (Erosion Control Blanket).

| Property | Units | Test Method | Requirement (1,2,3) |
|---|---|---|---|
| Thickness | in | ASTM D 6525 | 0.42 |
| Light Penetration | % | ASTM D 6567 | 35 |
| Resiliency | % | ASTM D 6524 | 64 |
| Mass per Unit Area | $lb/yd^2$ | ASTM D 6475 | 0.6 (1) |
| MD-Tensile Strength Max. | lb/ft | ASTM D 6818 | 127.0 |
| TD-Tensile Strength Max. | lb/ft | ASTM D 6818 | 50.9 |
| MD-Elongation | % | ASTM D 6818 | 29 |
| TD-Elongation | % | ASTM D 6818 | 30 |
| Swell | % | ECTC Procedure | 89% |

| | | | |
|---|---|---|---|
| Water Absorption | % | ASTM D 1117 / ECTC | 199 |
| Bench-Scale Rain Splash | @ 2 in/hr | ECTC Method 2 | SLR = 6.8(2,3) |
| Bench-Scale Rain Splash | @ 4 in/hr | ECTC Method 2 | SLR = 7.2(2,3) |
| Bench-Scale Rain Splash | @ 6 in/hr | ECTC Method 2 | SLR = 7.6 (2,3) |
| Bench-Scale Shear | lb/ft$^2$ @ ½ in of soil loss | ECTC Method 3 | 2.6 (3) |
| Germination Improvement | % | ECTC Method 4 | 645 |

Notes:

[1] Weight is based on a dry fiber weight at time of manufacturing. Baseline moisture content of Great Lakes Aspen excelsior is 22%.

[2] SLR is the Soil Loss Ratio, as reported by NTPEP/AASHTO.

[3] Bench-scale index values should not be used for design purposes.

C. Performance. Provide a Vegetated Concrete Block Mat that meets the requirements of Table 5:

Table 5 – Vegetated Concrete Block Mat Requirements.

| Test | Tested Value | Bed Slope | Soil Classification | Limiting Value |
|---|---|---|---|---|
| ASTM 6460 | Shear Stress | 30% | Sandy Loam (USDA) | 24 lb/ft$^2$ |
| ASTM 6460 | Velocity | 20% | Loam (USDA) | 30 ft/sec |

D. Equipment. Provide the proper equipment to place the mat that will not damage mat material or disturb the topsoil subgrade and seed bed.

E. Construction Requirements. Prior to installing Vegetated Concrete Block Mat, prepare the subgrade as detailed in the plans. All subgrade surfaces to be smooth and free of all rocks, stones, sticks, roots, and other protrusions or debris of any kind that would result in an individual block being raised more than 3/4in above the adjoining blocks. Provide a 4in thick topsoil layer for subgrade material that can sustain growth.

1) Ensure the prepared 4in thick topsoil subgrade provides a smooth, firm, and unyielding foundation for the mats. Grade the subgrade topsoil to conform with the lines, grades, and dimensions shown on the plans. Channels or ditches, grade shape to concentrate flow to middle of mat.

2) Distribute seed and fertilizer on the prepared topsoil subgrade before installation of the concrete mats in accordance with manufacturer specifications. Seed and fertilize according to the specifications in the revegetation special.

3) Install mats to the line and grade shown on the plans and per the manufacturer's guidelines. The manufacturer or authorized representative will provide technical assistance during the slope preparation and installation of the concrete block mats as needed.

4) At the upstream and downstream extent of the mat embed three blocks of the Vegetated Concrete Block mat into the subgrade to serve as an anchor trench.

5) Vertically embed two blocks of Vegetated Concrete Block mat at extents parallel to flow direction.

6) Provide fastening or anchoring as detailed in the plans. Provide "U" anchors that consist of #3 rebar.

F. Delivery and Storage. Cover the mat or otherwise protect it during long periods of storage to protect against degradation of the backing material as recommended by the manufacturer.

1) Inspect all mats upon delivery. Assure that all units are sound and free of defects that would interfere with the proper placing of the unit or impair the strength or permanence of the construction.

2) Chipping or missing concrete resulting in a weight loss exceeding 15% of the average weight of a concrete unit is grounds for rejection. Replace, repair, or patch the damaged areas per the manufacturer's recommendations.

G. Method of Measurement. The Vegetated Concrete Block Mat will be measured by the square yard, as shown on the plans, complete in place. Anchor trenches and overlaps are not measured for payment.

H. Basis of Payment. Payment at the contract unit price for Vegetated Concrete Block Mat – Square Yard is full compensation for all costs needed to furnish and install the item of work, including topsoil, fertilizer, seed, "U" anchors, overlaps, anchor trenches, vertical embedment areas, and any other required resources.

41. VEGETATED CONCRETE BLOCK MAT ALLOWABLE SUBSTITUTION

A. Description. Vegetated Concrete Block (VCB) mats are specified for Permanent Erosion & Sediment Control (PESC) measures. Refer to the associated summary frame and details in the plans for locations. Substitution of riprap for VCB mats will be allowed where the ditch grade is 25% (4:1) or flatter and outside of the roadside clear zone.

B. Materials.

1) Provide riprap meeting Class 1 requirements.

2) Provide Permanent Erosion Control Geotextile – Class C, High Survivability under all riprap.

C. Construction Requirements.

1) In locations where the ditch grade is 25% (4:1) or flatter and outside of the roadside clear zone, Class 1 riprap is allowed in place of VCB mats.

2) The finished surface of the riprap must match the same finished ditch dimensions identified in the plans for the VCB mats.

3) Excavate as needed to meet the finished surface requirements for the riprap. The minimum depth of Class 1 riprap is 1.5 ft.

4) Place Permanent Erosion Control – Class C Geotextile, High Survivability under the riprap, ensuring all sides are keyed in a minimum 18 inches per the VCB mat anchorage details.

5) Leave the riprap exposed, without any filler material, topsoil or seed mixture applied.

6) Overlap Erosion Control Blanket (ECB) to Riprap transitions in the same manner as shown on the detail for ECB to VCB Mat transitions in the plans.

D. Method of Measurement and Basis of Payment.

1) All work associated with substitution of the Class 1 Riprap, for the VCB mats will be measured and paid for as Vegetated Concrete Block Mat at the unit price bid per square yard of the finished surface of VCB (or riprap substitute) as shown on the plans, complete in place. The permanent erosion control geotextile, including the areas needed for the leading and trailing anchor trenches, and seam overlaps will not be measured for payment.

2) Payment at the contract unit price is full compensation for all necessary resources to complete the item of work under the contract. Payment for completed and accepted quantities is made by the Square Yard of Vegetated Concrete Block Mat.

42. TARP LOADS

Tarping loads may be necessary if excessive damage to the traveling public is caused by trucks hauling uncovered loads.

The cost associated with tarping truck loads will not be paid for separately but considered incidental to other items of the contract.

43. OUTLET APRON

A. Description. Provide optional material to prevent scour and/or erosion at outlet end of culverts.

B. Materials.

1) Riprap. Furnish Class II Riprap in accordance with Subsection 701.06.2.

2) Veg. Conc. Block Mat. Furnish Veg. Conc. Block Mat in accordance with Veg. Conc. Block Mat Special Provision.

3) Other approved materials. Furnish other materials approved by the Engineering Project Manager deemed to be equivalent to Class II Riprap or Veg. Conc. Block Mat.

C. Construction Requirements.

1) Riprap. Meet all requirements of Section 613.03.1 for the placement of Riprap.

2) Veg. Conc. Block Mat. Meet all requirements of Veg. Conc. Block Mat Special Provision for the placement of Veg. Conc. Block Mat.

3) Other materials approved by the Project Manager. Install materials per manufacturer specifications.

D. Method of Measurement and Basis of Payment.

1) Outlet apron associated with culvert outlet protection will be measured by the square yard as shown on the plans, complete in place. The leading and trailing anchor trenches, seam overlaps, geotextile, topsoil, and seeding will not be measured for payment.

2) Payment at the contract unit price is full compensation for all necessary resources to complete the item of work under the contract. Payment for completed and accepted quantities is made under the following:

| Pay Item | Pay Unit |
|---|---|
| Outlet Apron | Square Yard |

44. CEMENT TREATED BASE – CURING

A. Description. This work is the process of curing the cement treated base (CTB).

B. Construction. Meet the requirements of Section 304 for placement of the CTB with the following modification to curing requirements. When the CTB is finished to grade, apply the selected curing method from one of the three options:

1) Curing Seal & Blotter: Meet all the requirements of Section 304.03.8 for the placement of curing seal and blotter.

2) Water Cure: Keep the CTB surface moist (by lightly watering or misting) for a 7-day period following final compaction of the CTB or until the required minimum compressive strength is reached, whichever is greater. Do not let the top surface dry out completely during the curing period.

3) CAC Cure: Keep the CTB surface moist between final compaction and application of a minimum 4-inch thick lift of crushed aggregate course CAC over top of the CTB surface. Do not begin placement of the CAC over the CTB for a minimum of 48 hours after placement and compaction of the CTB. Do not use vibratory compaction equipment on the CAC layer unless minimum compressive strengths have been achieved.

4) Other methods approved by the Project Manager.

C. Method of Measurement and Basis of Payment. Curing of the CTB will not be measured separately for payment. Include all costs associated with this provision in the unit price bid per cubic yard of CTB.

45. ALTERNATE PRESTRESSED BEAM SECTIONS (REVISED 6-6-12)

A. Description

1) General. The contractor may elect to use an alternate prestressed beam shape if the resulting change in superstructure depth is less than or equal to the maximum allowed increase shown in the table below.

a) Provide five sets of shop drawings to the Project Manager meeting the requirements of Section 553 of the Standard Specifications. Shop drawings may be submitted on 11" x 17" sheets and may be furnished in Adobe Acrobat Reader (.pdf) format in lieu of hard copies. Have a professional engineer licensed in Montana sign, stamp or seal these plans and designs. Do not fabricate beams prior to receiving approved drawings.

b) b) Provide a revised set of design drawings showing all changes to the bridge. Prepare the drawings using a CAD system. Submit the drawings in Adobe Acrobat Reader (.pdf) format. Include a cover letter signed by the supervising engineer transmitting the finished drawings. In addition, provide the CAD files used to detail the revisions. Upon request, the original design drawings will be made available.

B. Measurement and Payment. The beam and slab shown on the plans will be the configuration measured or calculated for payment. Furnish and install at no cost to the state any additional beam footage, slab concrete or slab reinforcing steel, or substructure concrete or reinforcing steel required because of the use of alternate beam shapes.

| Bridge at Station | Maximum Allowed Increase in Superstructure Depth |
|---|---|
| 1891+19.00 | 0.42' |
| 1934+88.25 | 2.95' |

46. SALVAGED MATERIAL

A. Description

1) Salvage the guardrail end extruder head, 1st post and 1st rail section from the terminals on each of the timber structures being removed for MDT,

2) Salvage timber stringers for FWP.

3) Dispose of material that is obviously not reusable.

B. Construction Requirements. Remove the structures in accordance with Section 202 of the Standard Specifications and these Special Provisions and neatly stockpile the salvaged material at each site, as directed for pickup.

Guardrail Ends Salvage: Contact Mark Kurokawa (406) 653-6709 at the MDT Wolf Point Maintenance office at least 2 weeks prior to delivering materials to the Flowing Wells Maintenance Yard just north of the Flowing Wells Rest Area to arrange delivery.

Bridge Stringers Salvage: Contact Fish, Wildlife & Parks' Michelle McGree at 444-2432, (mmcgree@mt.gov) at least three weeks before salvaged materials are ready for pickup.

Dispose of any material that remains eight weeks after FWP has been contacted regarding the salvaged materials. Load salvaged material onto FWP's transport.

Dispose of all non-salvageable and any left-over salvageable material in accordance with all applicable laws, rules and regulations. Pay special attention to the following responsibilities:

1) Burning or burial of treated timbers and bridge decking is not an acceptable means of disposal under any circumstances.

2) Dispose of treated timbers in a licensed Class II landfill only. Advance written approval of the landfill manager may be required. If the landfill requires sampling of the timbers, the Project Manager will perform the sampling.

C. Method of Measurement and Basis of Payment. Payment for all costs associated with the disposal or salvage of all material and all costs of furnishing all materials, equipment, tools, and labor necessary and incidental to completing the work described under this item, is included in the lump sum bid for Remove Structure.

47. GIRDER TEMPERATURE REQUIREMENTS FOR FIXED SHOE WELDING (REVISED 6-4-09)

A. Description. Weld the sole plates of the fixed shoes as specified to reduce thermal stresses at fixed bents. Do not place deck concrete until after completing all girder-to-shoe welds on the bridge.

B. Construction Requirements. Weld each girder composing a single span to its shoes only when the average temperature of each girder has been determined to be between 40 and 60 degrees Fahrenheit. Complete the welding of the shoes at both ends of each girder so that the temperature of the girder, as measured by the method provided herein, does not change between the times the welds are placed. Align and center both plates of the fixed shoes on the anchor bolts and center the girder between bearings when the welds are placed at the fixed shoes. Correct girder or plate location as necessary.

C. Temperature Measurements. Measure girder temperature by surface thermometer, non-contact infrared or other method approved by the Project Manager. Calculate the average temperature from two or more readings taken near the bents at each end of the spans. Take the readings on shaded portions of the members and follow the recommendations of the thermometer manufacturer.

D. Basis of Payment. Consider all costs associated with this provision incidental to the construction of the bridge. Include the cost in the cost of other items.

48. BRIDGE DECK REINFORCING STEEL COVER [564] (REVISED 10-28-21)

A. Description. The Department may measure the depth of the concrete cover over the top reinforcing steel of the bridge deck(s) and the deck thickness, using Ground Penetrating Radar (GPR) equipment.

B. Construction Requirements. Schedule 3 business days for the Department to access the deck. Ensure the deck is completely bare during the 3 business-day period, or until the test is complete, to allow full access to the entire surface. The timeframe for access to the bridge deck is after the water cure has been completed and prior to opening the bridge deck to traffic. The Department will perform the test only on a dry deck. The test may be completed either prior to or after transverse deck grooving or rail construction. If inclement weather prevents the test from being performed within the 3 business days provided, the test will be cancelled or rescheduled. Provide the Project Manager a minimum of 14 calendar days' notice for the 3 business-day access period. The Project Manager will coordinate the test with the Department's CES Bridge Reviewer.

C. Method of Measurement and 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.

49. MODIFIED BRIDGE DECK CONCRETE WATER CURE [551] (REVISED 3-2-2020)

A. Description. Protect full depth bridge deck concrete from shrinkage and thermal cracking.

B. Materials.

1) Burlap. Furnish burlap in accordance with Subsection 717.01.2.

2) Water. Furnish water in accordance with Subsection 713.01.

3) Temperature data logging. Submit for approval a temperature monitoring system having at least 4 channels, capable of measuring internal concrete and ambient temperatures,

recording time and temperature at 30-minute intervals or less for a minimum of 14 days, with an accuracy of 1 degree or less.

C. Construction Requirements.

1) For each concrete placement, install 4 probes at 3 locations on the deck (12 probes total per placement) in concrete a minimum of 5 feet away from any edge or joint. For placements that are less than 10 cubic yards, place only 4 probes at one location. Place and secure probes at 4 depths within the deck as follows:

- at least 2 feet above deck surface. This probe may be moved to the edge of deck to facilitate attachment;
- to the top of the top mat of rebar;
- midway between the 2 mats of rebar, and;
- to the bottom of the bottom mat of rebar.

2) Start recording temperatures at least 1 hour prior to concrete placement. Ensure probes read within 3.6 °F (2 °C). Replace probes that do not. Protect probes during concrete placement. Relocate any displaced probes within wet concrete. Monitor and record ambient air temperature while recording probe temperatures. Monitor concrete temperature probes until concrete is within 5 °F (2.8 °C) of ambient, and vertical temperatures through the deck thickness are uniform (within 10 °F [5.5 °C]) and concrete is at least 96 hours old (72 hours old if concrete does not contain silica fume).

Exception: for cold weather concrete, monitor temperatures until cold weather protection is removed.

3) Increase ambient humidity by fogging above finished concrete and concrete forms/rebar using one or more 3000 psi (21MPa) or greater pressure washer powered fogging wands. Do not:

- use low pressure spray nozzles;
- use fogging systems attached to the screed;
- use fogging, or other methods, to add finishing water to unfinished concrete;
- 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.

4) Maintain the forward edge of concrete placement nearly parallel to and not more than 6 feet (1.8 m) ahead of the strike-off.

5) Use catwalk(s) to facilitate uniform application of the fog mist across the entire deck and to facilitate placement of the wet burlap on the fresh concrete surface. Apply a fog mist as necessary to maintain a moist surface on the finished concrete before and after covering with burlap until the water cure process is operational.

6) Start the water cure as soon as possible without damaging the concrete finish by applying pre-moistened burlap to maintain a water-saturated environment on the concrete surface. Meet the following requirements for the water cure.

a) Ensure the temperature of all water used in the water cure is within 20 °F (17 °C) of the in place concrete temperature.

b) Presoak the burlap by immersing it in water for at least 24 hours prior to placement.

c) Apply the wet burlap to the concrete surface no later than 15 minutes after striking off and finishing the surface of deck-slab concrete.

d) Place soaker hoses when the concrete has hardened sufficiently to prevent marring of the surfaces.

e) Keep the entire deck surface saturated for 3 hours (1 hour for cold weather concrete, unless otherwise approved by the Project Manager) after concrete has reached maximum temperature as recorded by the probes. Immediately turn off soaker hoses and apply clear plastic sheeting over the wet burlap to keep concrete moist.

f) Apply cold weather insulation blankets to minimize the rate of cooling of concrete immediately following the installation of plastic sheeting.

g) Remove all curing and allow deck to dry when concrete is within 5 °F (2.8 °C) of ambient, and vertical temperatures through deck thickness are uniform (within 10 °F [5.5 °C]) and the concrete is at least 96 hours old (72 hours old if concrete does not contain silica fume).

D. Method of Measurement and Basis of Payment. Fogging and water cure will not be measured separately for payment. Include all costs associated with this provision in the concrete receiving the cure.

50. CONCRETE - CLASS STRUCTURE LOW SLUMP (REVISED 9-9-21)

A. Description. Furnish Concrete – Class Structure Low Slump for all full depth bridge deck concrete, bridge barrier rail, and metal bridge rail curbing.

B. Construction Requirements. Furnish material meeting the requirements of Concrete – Class Structure, with the following modifications:

1) The maximum target value for slump is 3-inches with a tolerance of plus 1½-inches to minus 2-inches.

2) When used in bridge barrier rail or metal bridge rail curbing, the target slump may be adjusted to a maximum of 6-inches.

3) Overall Lot Pay Factor. The overall lot pay factor will be calculated for all bid items using Concrete – Class Structure Low Slump, except metal bridge rail.

4) Applicable Pay Factors. See Table 551-9 for applicable pay factors. Pay factors for strength, air content, and gradation are applicable. The pay factor for permeability is not applicable.

C. Measurement. Concrete – Class Structure Low Slump is measured by the cubic yard.

D. Basis of Payment. Include all costs associated with this provision in the bid price for Concrete – Class Structure Low Slump (CUYD).

51. RIDE SPECIFICATION CATEGORY (SINGLE) [401] (REVISED 12-13-12)

This is a Category I project.

52. DO NOT DISTURB EXISTING CEMETERY

There is an existing cemetery south of the new right-of-way line near RP 253.55, which is in the end of project connection. In the event permission to access private property is secured for staging or otherwise, do not disturb this area in any way.

53. CORRUGATED POLYETHYLENE APPROACH PIPE [603] (REVISED 12-12-19)

A. Description. Corrugated polyethylene pipe is an option to RCP, CSP or CAP for approach drainage pipes as indicated in the Approach Pipe Summary.

B. Material. Meet the requirements of Subsection 708.07 of the Standard and Supplemental Specifications for Road and Bridge Construction, and of Type S pipe as defined in Section 4 of AASHTO M294.

C. Construction Requirements. Provide steel Flared End Terminal Sections (FETS) or Road Approach Culvert End Treatment (RACET) in accordance with Detailed Drawing 603-02 and 603-14. Provide hardware for connection of the end section to the polyethylene pipe as approved by the Project Manager.

D. Basis of Payment. Cost of materials, handling, tools, equipment and labor necessary to accomplish the work is included in the contract unit price bid per foot (meter) of drainage pipe.

54. PRECAST REINFORCED BOX CULVERTS [603] (REVISED 2-18-16)

A. Description. Precast reinforced concrete box culvert (RCB) is specified at locations shown on the plans.

B. Materials.

1) RCB. Furnish RCB that meet the requirements HL-93 live loading. RCB must also meet the requirements of ASTM C1577, except the aggregate gradations must meet Subsection 701.01 or a Department approved optimized gradation. Refer to ASTM special design provisions for RCB sizes that are not included in the ASTM table or for any changes in wall thickness. Use Type V cement unless otherwise specified.

2) Joint Sealant. Install flexible plastic gaskets between culvert sections meeting the requirements of Subsection 707.02. Provide joint material that is 1.25 inch (31.75 mm) equivalent diameter (1 inch (25.4 mm) x 1.23 inch (31.12 mm) actual dimensions).

3) External Joint wrap. Furnish Type III, chemically bonded adhesive butyl bands for all joints between box sections meeting the requirements of ASTM C877. Use Type A designation with a sealing bandwidth of 12 inch (300 mm). Apply joint wrap material externally around each joint over semi-liquid paintable butyl rubber-based adhesive primer. Begin each joint wrap at haunch, extend up and over the top of the culvert, and terminate at the other haunch. Extend joint wrap under the haunches as far as possible on each side of the box culvert while maintaining seal with adhesive primer. If two or more pieces are required, lap a minimum of 6 inches (150 mm). Replace punctured or torn joint wrap damaged by culvert installation at Contractor expense.

4) Bedding material. Use granular bedding material for bedding material. Provide a 12-inch (300 mm) thick base. Compact granular bedding by proof rolling with vibratory compactor or by using a method approved by the Project Manager.

5) Flared or Tapered End Section. Furnish precast flared or tapered end sections according to the RCB detail.

6) Optional Cutoff Walls. Cast-in-place or precast cutoff walls are acceptable for the ends of RCB.

7) Reinforcing Steel. Use rebar dowels meeting the requirements of AASHTO M 31, Grade 60 (Grade 420).

8) Epoxy Resin Bonding Adhesive. Meet the requirements of AASHTO M 235 Type 4.

C. Construction Requirements.

1) Joint Tolerance. When placing RCB sections in final position, the gaps between sections must not exceed 0.75 inch (19 mm). Check for misalignment by measuring normal to the walls and slabs. Correct misalignment between sections before adding the next section.

2) Lift Holes. Plug all lift holes and fabrication holes before placing backfill. Use the manufacturer supplied plugs for filling holes in the top slab. Grout all holes in the side and floor slabs.

3) Tie Bolt Holes. Fill the annular area by injecting silicone caulking in tie bolt holes or fill with joint material after installation of the bolt and before placing the washer.

4) Manufacturer's Installation Procedure. Follow the recommended installation procedure provided by the manufacturer. Provide the Project Manager one copy of the recommended procedure ten calendar days before installation.

5) Welding Requirements. Perform all welding on precast member connections in accordance with AWS D1.1 Structural Welding Code.

Alternate Connection – Concrete Edge Protection. Drill holes in RCB end sections at locations shown on the plans. Epoxy bond #6 (#19) rebar dowels with 8 inches (203 mm) minimum protrusion. The required depth of embedment is RCB wall thickness minus 2 inches (50 mm). Minimum distance from edge of RCB to center of hole is 4 inches (100 mm). Follow adhesive manufacturer's recommendations for hole diameter and other installation requirements.

Precast Concrete Curb Connection. When precast concrete curbs are required at the RCB ends, connect the curbs to the RCB using the precast holes in the curb. Mark the hole locations and drill and epoxy bond #6 x 12 inch (#19 x 305 mm) rebar dowels into the RCB a depth of 5 inches. Follow manufacturer's recommendations for hole diameter and other installation requirements. Install curb, centering the dowels in the holes and fill the curb holes with non-shrink grout.

Precast Cut-off Wall Connection. If precast cut-off walls are used, connect the RCB end to the cut-off wall using the precast holes provided in the RCB. Drill 1.5 inch diameter x 6 inch (40 mm x 150 mm) holes in the cut-off wall at each location. Clean hole of loose debris, fill hole in cut-off wall with approved non-shrink grout and install #6 x 12 inch (#19 x 305 mm) long rebar into the hole keeping the rebar centered. Fill remaining hole in RCB with grout.

Fillets. Reinforce fillets with a minimum of #3 grade 60 rebar at 12-inch centers.

6) Submittals. Submit five sets of shop drawings and all supporting hand and computer design calculations to the Project Manager for approval prior to fabrication. Shop drawings may be furnished in Adobe Acrobat Reader (.pdf) format or 11"x17" sheets. All design plans and calculations must be signed and sealed by a Professional Engineer registered in the State of Montana. Calculations are to include load rating factors for design vehicle. Calculate rating factors in accordance with the latest version of the AASHTO Manual of Bridge Evaluation. Submit all welding procedure specifications and welder qualification records to the Project Manager for approval prior to welding precast connections. Submit epoxy bonding system to the Project Manager for approval prior to installation.

D. Method of Measurement. Precast Reinforced Concrete Box Culvert is measured in accordance with Subsection 603.04.

E. Basis of Payment. Include all costs associated with this item, as well as all pumping, bailing, and drainage necessary for foundation preparation, in the unit price bid per foot (meter) for Reinforced Concrete Box Culvert.

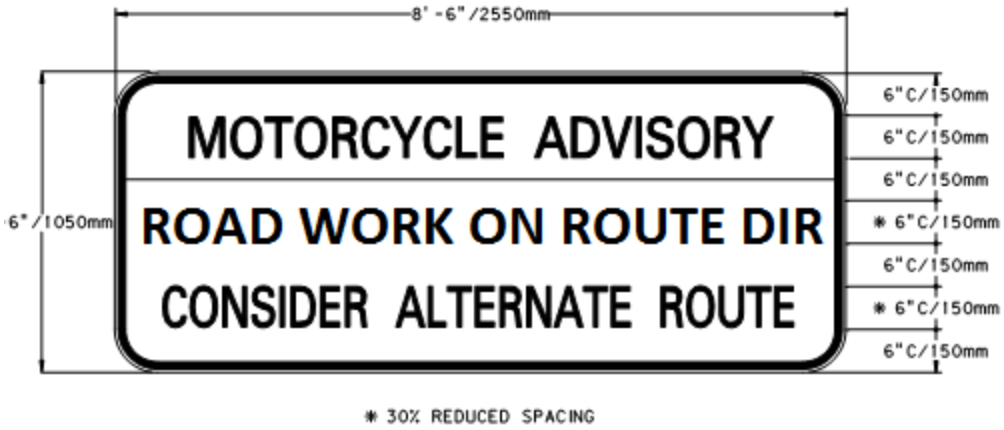
Payment at the contract unit price is full compensation for all necessary resources to complete the item of work under the contract.

55. MOTORCYCLE ADVISORY SIGNS [619] (REVISED 7-16-20)

A. Description. This work is the furnishing, installing, maintaining, and removal of motorcycle advisory signs.

B. Materials. Furnish materials meeting the requirements of Subsection 618.02. Furnish ASTM D4956 type VI or higher retro-reflective sheeting.

C. Construction Requirements. Furnish and install the signs shown on the following detail to the required typical cross section and profile grade, meeting Detailed Drawing 618-01, two-post installation, at the locations listed in the contract. The ROUTE will specify the route number and the DIR will specify the direction of the construction. The sign must meet the height requirements specified on the Detailed Drawing.




For rural intersections install sign(s) on the right shoulder within 1000 feet to 1500 feet (300 m to 450 m) in advance of the roadway's intersection. For urban intersections install sign(s) within 200 feet (60 m) of the roadway's intersection. Adjust sign within the specified distance to prevent obstruction from existing signs.

Install sign(s) no more than 2 calendar days before construction activities begin that change the roadway surface from a paved surface to an unpaved surface. Remove sign(s) within 2 calendar days after the roadway surface has a paved surface.

Coordinate with the Project Manager the date the sign(s) are to be installed, the verification of the sign locations, and the date of removal.

D. Method of Measurement. Motorcycle advisory signs, including all costs associated with labor, materials, tools and equipment required to provide, install and remove are measured by the Each.

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

| Pay Item | Pay Unit |
|---|---|
| Motorcycle Advisory Signs | Each |

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

END OF SECTION I.

**MDT NONDISCRIMINATION AND**
**DISABILITY ACCOMMODATION NOTICE**

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, income-level & 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, ancestry, age, disability mental or physical, political or religious affiliations or ideas, military service or veteran status, vaccination status or possession of immunity passport |

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. The PARTY will provide notice to its employees and the members of the public that it serves that will include the following:
    i. A statement that the PARTY does not discriminate on the grounds of any protected classes.
    ii. A statement that the 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 the 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, the 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 the 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 MDT 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. The 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 statutes 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.

SEEDING SPECIAL PROVISIONS

Project No: NH-HSIP 57-5(56)247 Project Name: Flowing Wells – East & West
Project length: 6.8 miles CN: 9726000

| Area Descriptions | |
|---|---|
| Area 1 | Areas with slopes 3:1 and flatter |
| Area 2 | Areas with slopes steeper than 3:1 or inaccessible to drill seed equipment |
| Area 3 | A 15-foot wide strip adjacent and parallel to the finished pavement, on both sides. |

1) Topsoil. Salvage and/or furnish sufficient quantities of topsoil in accordance with Subsection 713.05 and/or 610.03.1 of the Standard Specifications to place an average 4inch loose depth over all disturbed areas. Place the topsoil in accordance with Subsection 203.03.6 of the Standard Specifications immediately following grading.

2) Fertilizer.

| | Nitrogen lbs per acre | P2O5 lbs per acre |
|---|---|---|
| Area 1 & 2 | 10—15 | 30—35 |
| Area 3 | None | None |

3) Seedbed preparation and application. Condition all drill seeded areas within 24 hours prior to seeding. Areas too steep, narrow, or otherwise inaccessible to drill seeding equipment can be broadcast seeded at double the drill seeding rates. Rake, harrow or otherwise scarify broadcast seeded areas to incorporate the seed ¼ to ½ inch into the soil. Seeding outside the designated seeding period is allowed only with prior approval from MDT's Reclamation Specialist.

| | Method | Seeding Depth | Season of Seeding |
|---|---|---|---|
| Area 1 | Drill Seed | 0.25 – 0.5 in | 10/1—5/15 |
| Area 2 | Dry Broadcast Seed | | 10/1—5/15 |
| Area 3 | Drill Seed | 0.25—0.5 | 10/1—5/15 |

4) Provide the following reclamation seed mixtures. Use substitute species only if the recommended species is not available and substitution is approved by MDT's Reclamation Specialist.

| Area 1 | | | Drill Seeding Rate | | |
|---|---|---|---|---|---|
| Scientific Name | Common Name | Variety | PLS / sq. ft. | % of Mix | Pounds PLS/ acre |
| *Elymus trachycaulus* | Slender wheatgrass | Pryor | 6 | 8 | 2.0 |
| *Pascopyrum smithii* | Western wheatgrass | Rosana | 6 | 8 | 3.0 |
| *Elymus canadensis* | Streambank wheatgrass | Sodar | 7 | 8 | 2.0 |
| *Poa secunda* | Canby bluegrass | Canbar | 10 | 13 | 0.5 |
| *Achnatherum hymenoides* | Indian ricegrass | Rimrock | 16 | 20 | 3.0 |
| *Nassella viridula* | Green needlegrass | Lodorm | 13 | 16 | 3.0 |
| *Schizachyrium scoparium* | Little bluestem | Badlands | 12 | 14 | 2.0 |

| | | | | | |
|---|---|---|---|---|---|
| *Ratibida columnifera* | Prairie coneflower | Stillwater | 7 | 8 | 0.5 |
| *Cleome serrulata* | Rocky Mountain Beeplant | VNS | 4 | 5 | 3.0 |
| | | GRAND TOTAL | 81 | 100 | 19.0 |

| | |
|---|---|
| Area 2 = Area 1 | Broadcast seeding rate is 2X drill seeding rate of Area 1. |

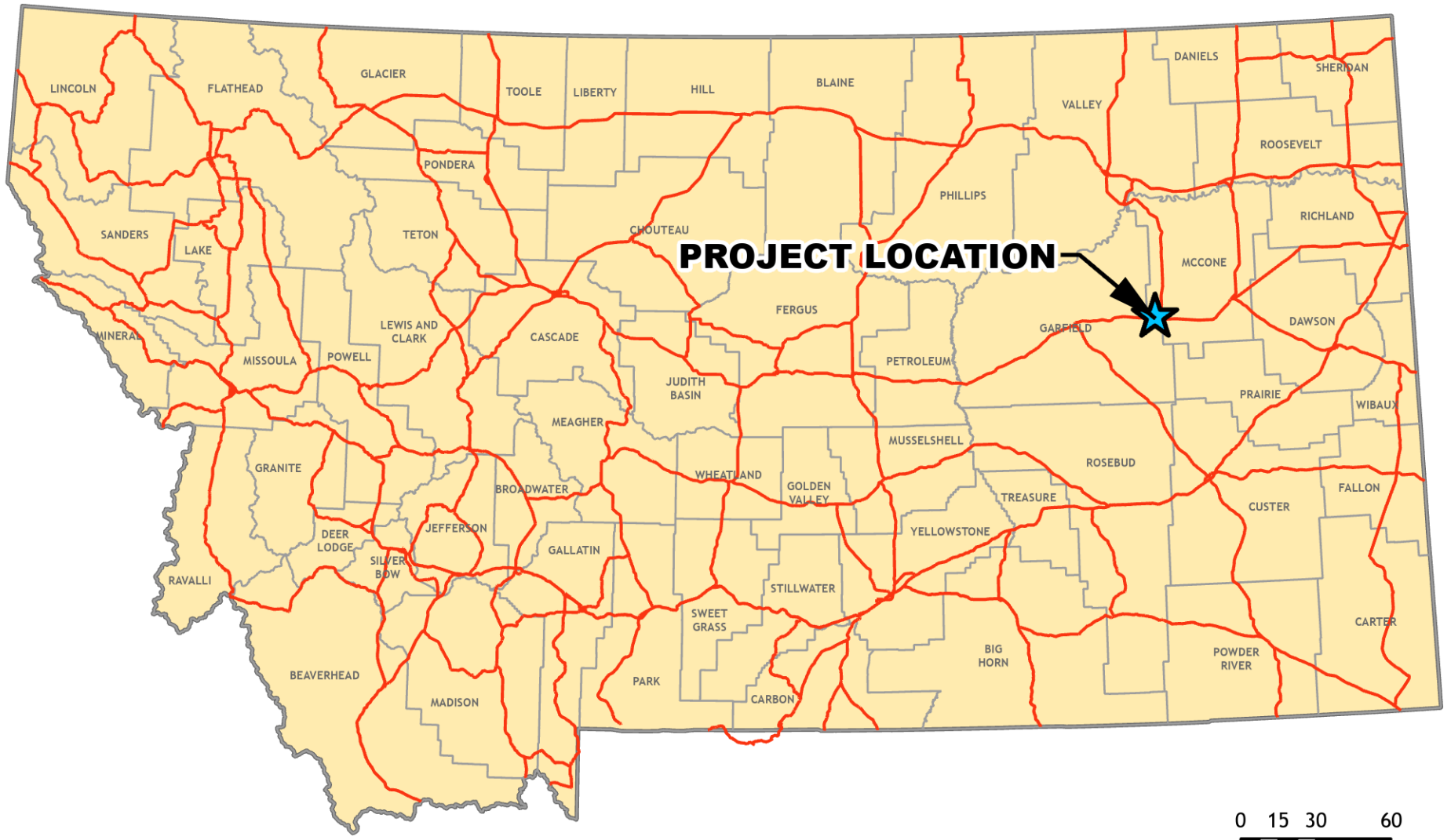
| Area 3 | | | Drill Seeding Rate | | |
|---|---|---|---|---|---|
| Scientific Name | Common Name | Variety | PLS / sq. ft. | % of Mix | Pounds PLS/ acre |
| *Elymus trachycaulus* | Slender wheatgrass | Pryor | 6 | 7 | 2.0 |
| *Pascopyrum smithii* | Western wheatgrass | Rosana | 6 | 7 | 3.0 |
| *Elymus lanceolatus* | Streambank wheatgrass | Sodar | 7 | 8 | 2.0 |
| *Poa secunda* | Canby bluegrass | Canbar | 10 | 12 | 0.5 |
| *Sporobolus cryptandrus* | Sand dropseed | VNS | 32 | 37 | 0.25 |
| *Bouteloua gracilis* | Blue grama | Birdseye | 19 | 21 | 1.0 |
| *Ratibida columnifera* | Prairie coneflower | Stillwater | 7 | 8 | 0.5 |
| | | GRAND TOTAL | 87 | 100 | 9.25 |

# FEDERAL AID PROJECT NH-HSIP 57-5(56)247
# GRADE, GRAVEL AND PLANT MIX SURFACING
# FLOWING WELLS - EAST & WEST
# CONTROL NUMBER 9726000
# PROJECT LOCATION STATE MAP - MONTANA

MONTANA
Department of Transportation

N

SECTION II

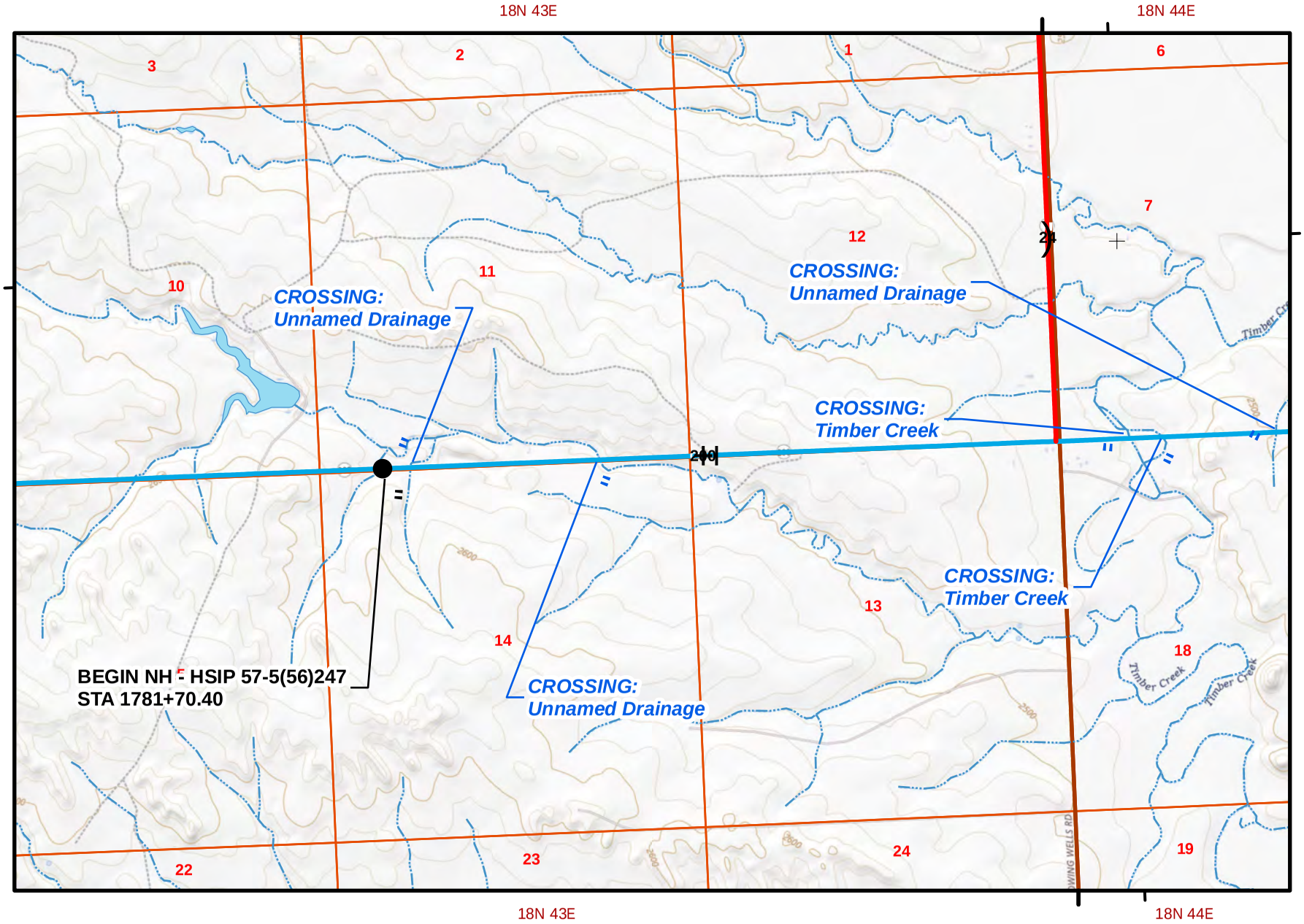


SECTION II

# FEDERAL AID PROJECT NH - HSIP 57-5(56)247
# GRADE, GRAVEL AND PLANT MIX SURFACING
# FLOWING WELLS - EAST & WEST
# CONTROL NUMBER 9726000
# PROJECT LOCATION QUAD MAP - GARFIELD & MCCONE COUNTIES 1 of 3

MONTANA
Department of Transportation

0 500 1,000 2,000
Feet

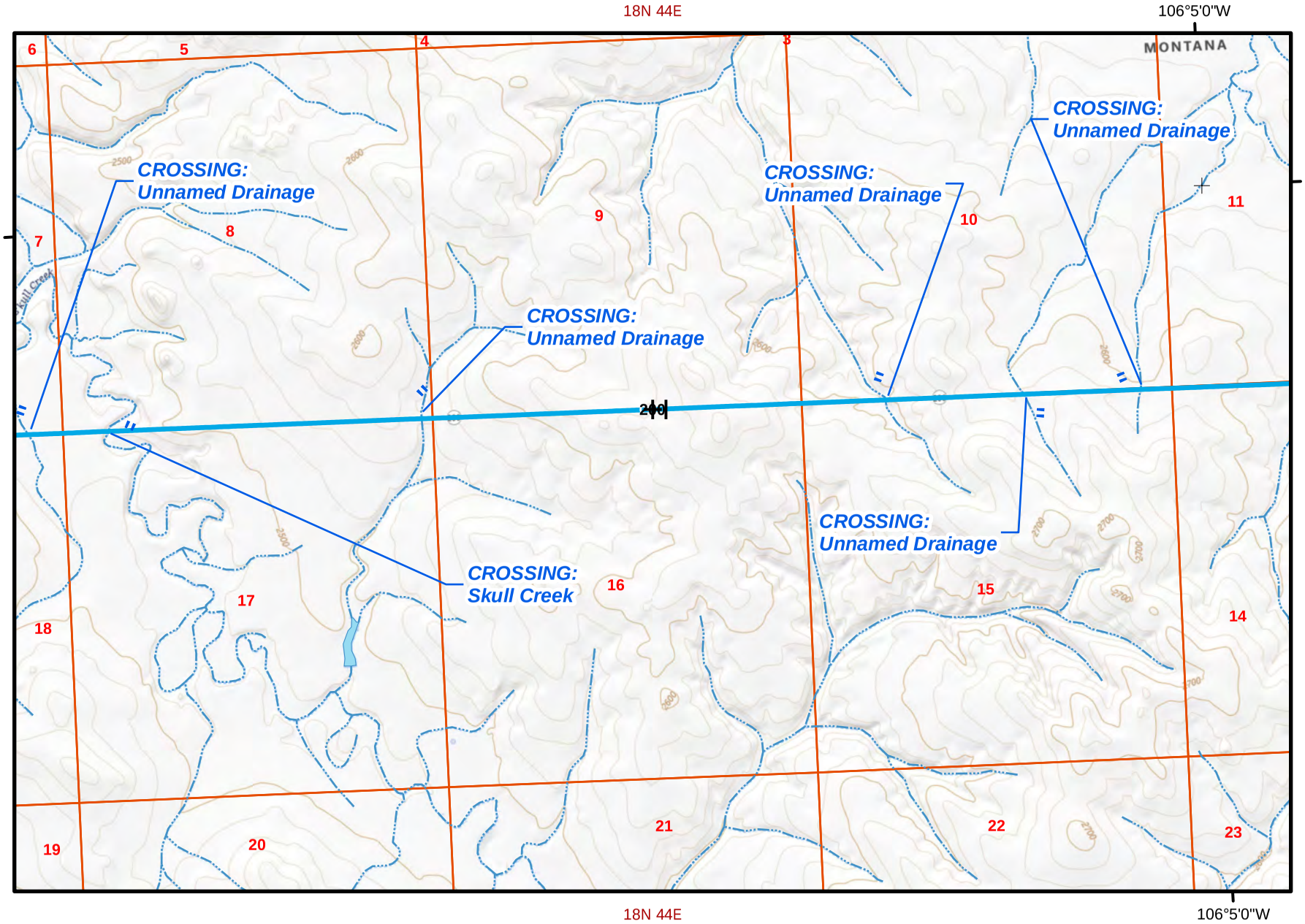


SECTION II

# FEDERAL AID PROJECT NH - HSIP 57-5(56)247
# GRADE, GRAVEL AND PLANT MIX SURFACING
# FLOWING WELLS - EAST & WEST
# CONTROL NUMBER 9726000
# PROJECT LOCATION QUAD MAP - GARFIELD & MCCONE COUNTIES 2 of 3

MONTANA
Department of Transportation

0 500 1,000 2,000
Feet




Page 9 of 70

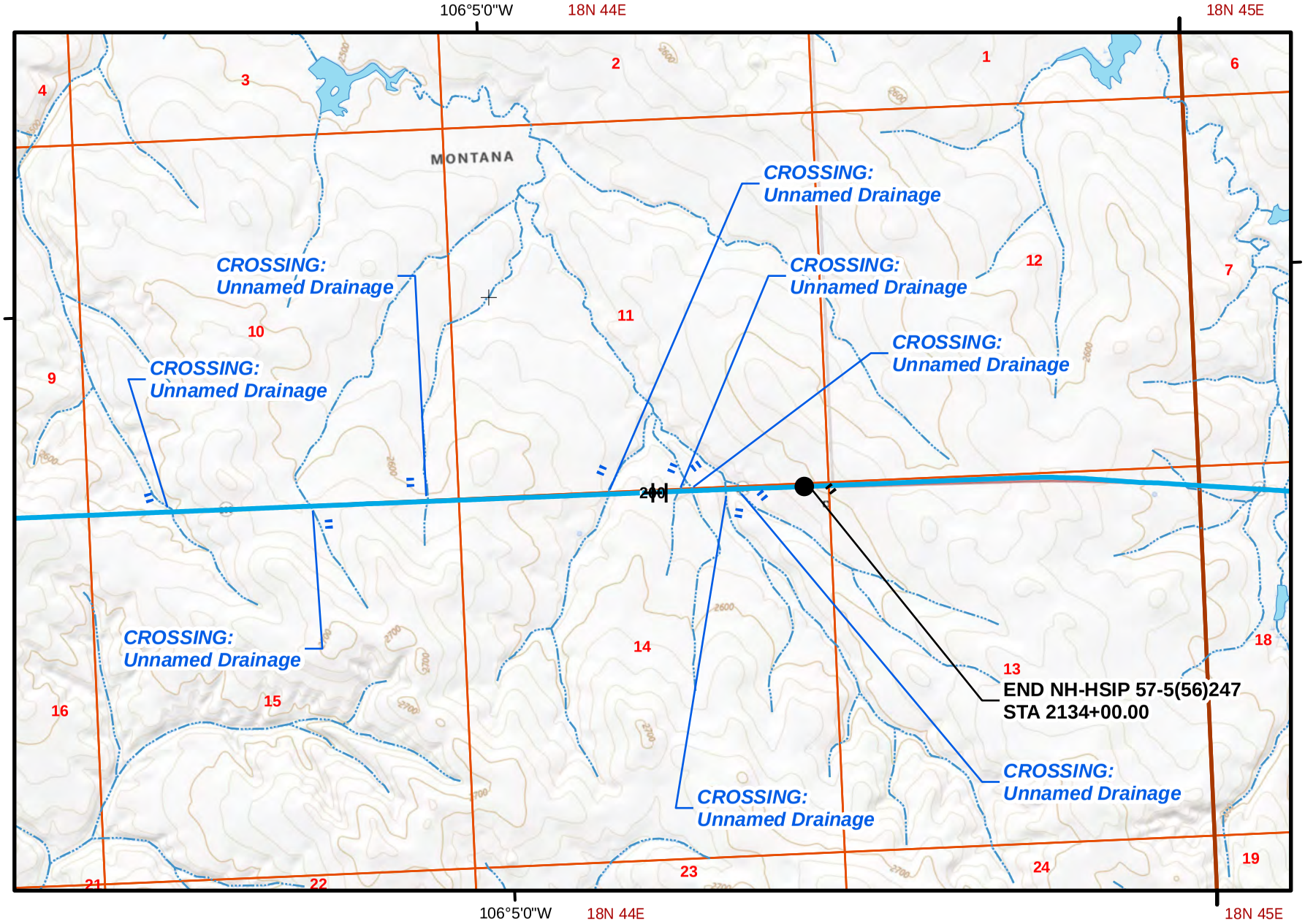
ADVERTISED COPY

SECTION II

# FEDERAL AID PROJECT NH - HSIP 57-5(56)247
# GRADE, GRAVEL AND PLANT MIX SURFACING
# FLOWING WELLS - EAST & WEST
# CONTROL NUMBER 9726000
# PROJECT LOCATION QUAD MAP - GARFIELD & MCCONE COUNTIES 3 of 3

MONTANA
Department of Transportation

0 500 1,000 2,000
Feet






ADVERTISED COPY

# MDT Boring Log Descriptive Terminology

## Key to Soil Symbols and Terms

01/18/12

MONTANA MDT DEPARTMENT OF TRANSPORTATION
Geotechnical Section

### 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.

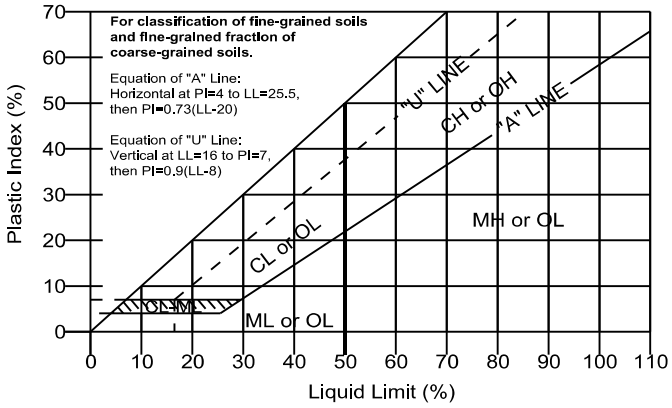
### Notes

***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)

# MDT Boring Log Descriptive Terminology
## Key to Rock Symbols and Terms

01/18/12

MONTANA MDT DEPARTMENT OF TRANSPORTATION
Geotechnical Section

| 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***

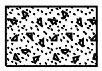
| | |
|---|---|
| Very Soft | -Can be carved with knife. Can be excavated readily with point of rock hammer. Can be scratched readily by fingernail. |
| Soft | -Can be grooved or gouged readily by knife or point of rock hammer. Can be excavated in fragments from chips to several inches in size by moderate 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:**

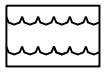
UCS = Unconfined Compressive Strength obtained from laboratory testing at the given depth.

***See Soil Boring Information Special Provision.***

# Miscellaneous Soil/Rock Symbols and Terms

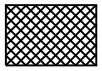

**Concrete**

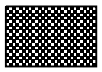

**Asphalt**

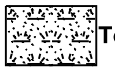

**Water**


**Boulders and Cobbles**


**Coal**


**Fill**


**Millings**


**Topsoil**

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

### 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 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.

Operation Types: Auger, Casing Advancer, Core Barrel, Drive Casing

Sample Types: Split Spoon, Shelby, Bulk Sample, Grab Sample, Cone Penetrometer, Vane Shear, Special Samplers, Testpit

***Example Rock Log***

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

**Page 2 of 2**

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-1**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138550.8 ft<br>**Coordinates** E: 2786248.2 ft | **Station:** 1803 + 50<br>**Offset:** 27 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2538.1 ft |
| **Date Started:**<br>2/3/22 | **Date Finished:**<br>2/3/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Helgerson<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 43E 11 - DC<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILT with sand (ML), loose to very loose, moist, light brown, [A-4]. Occasional white evaporites. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 80 | | 3 - 2 - 2 | | | | 11 | | | | | | |
| 5<br>2533.1 | | | 70 | | 2 - 2 - 2 | | | | 14 | | | | | | |
| | | | 100 | | 1 - 2 - 3 | | | | 11 | | NP | 79 | | | |
| 10<br>2528.1 | | | 100 | | 2 - 1 - 2 | | | | 13 | | | | | | |
| | | | | | | | Lean CLAY (CL), soft, moist, brown, [A-6]. | 11.5<br>2526.6 | | | | | | | |
| | | | 93 | | 2 - 2 - 2 | | | | 16 | | | | | | |
| 15<br>2523.1 | | | 93 | | WH - 2 - 3 | | | | 18 | | | | | | |
| 20<br>2518.1 | | | 100 | | 3 - 5 - 13 | | Clayey SAND with gravel (SC), medium dense, moist, brown, fine to coarse grained, subangular to angular, [A-2]. Frequent iron oxide staining. | 20.0<br>2518.1<br>21.4<br>2516.6 | 11<br>10 | | | | | | |
| | | | | | | | Shaley CLAYSTONE, brownish gray, very soft to soft field hardness. Frequent rusty brown to maroon stained fracture faces. | | | | | | | | |
| 25<br>2513.1 | | | 100 | | 3 - 6 - 15 | | | | 19 | | | | | | |
| | | | | | | | Boring Depth: 26.5 ft, *Elevation: 2511.6 ft* | 26.5<br>2511.6 | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 18.7' after augers removed. |
|---|---|---|
| End of Drilling: Not Encountered, Augers In | During Drilling: Not Encountered<br>After Drilling: Not Encountered, Augers Out | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:42 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-2**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138563.2 ft<br>**Coordinates** E: 2786598 ft | **Station:** 1807 + 00<br>**Offset:** 25 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2512.5 ft |
| **Date Started:**<br>2/2/22 | **Date Finished:**<br>2/2/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Helgerson<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 43E 11 - DC<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clayey SAND (SC), very loose, moist to wet, grayish brown, fine grained, [A-2]. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 93 | | 1 - 2 - 2 | | | | 21 | | | | | | |
| 5<br>2507.5 | | | | | | | | 4.8<br>2507.7 | | | | | | | |
| | | | 100 | | 1 - 2 - 6 | | SILT (ML), loose, wet, light brown to tan, [A-4]. | | 28 | | NP | 100 | | | |
| | | | 100 | | 12 - 21 - 29 | | SILTSTONE, grayish brown, very soft field hardness. Poorly lithified. | 7.8<br>2504.7 | 22 | | | | | | |
| 10<br>2502.5 | | | | | | | | 10.0<br>2502.5 | | | | | | | |
| | | | 87 | | 5 - 7 - 10 | | CLAYSTONE, gray, soft to very soft field hardness. Occasional rusty brown to maroon speckling. | | 25 | | | | | | |
| | | | 100 | | 5 - 13 - 20 | | | | 19 | | | | | | |
| 15<br>2497.5 | | | | | | | | | | | | | | | |
| | | | 100 | | 12 - 14 - 27 | | | | 17 | | | | | | |
| | | | | | | | Boring Depth: 16.5 ft, *Elevation: 2496.0 ft* | 16.5<br>2496.0 | | | | | | | |

| Water Level Observations | |
|---|---|
| ▽ During Drilling: **4.8 ft** *(2507.7 ft)* | Remarks: |
| ▼ End of Drilling: **15.0 ft** *(2497.5 ft), Augers In* | ▼ After Drilling: **5.0 ft** *(2507.5 ft) +0.25 hrs, Augers Out* |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:42 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-3**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138555.9 ft<br>**Coordinates** E: 2786964 ft | **Station:** 1810 + 66<br>**Offset:** 3 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2510.3 ft |
| **Date Started:**<br>2/2/22 | **Date Finished:**<br>2/2/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Helgerson<br>**Logger:** Jaynes | **Notes:** Timber Creek tributary | | | **PLS TRS-QQ:** 18N 43E 11 - DD<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Silty SAND (SM), moist, grayish brown, fine grained, [A-2]. Trace thin roots. Occasional black organics. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 23 | | 2 - 1 - 2 | | Lean CLAY with sand (CL), very soft, moist, grayish brown, [A-6]. | 2.9<br>2507.4 | 23 | | | | | | |
| 5<br>2505.3 | | | 85 | | | | Silty SAND with gravel (SM), medium dense, wet, grayish brown, fine to coarse grained, subangular to angular, [A-2]. Fine to coarse grained silty gravel layer 5'-5.5'. | 4.0<br>2506.3 | | | NP | 21 | | | |
| | | | 100 | | 4 - 8 - 8 | | | | 23 | | | | | | |
| | | | | | | | CLAYSTONE, grayish brown to gray, soft to very soft field hardness. Occasional rusty brown to maroon speckling. | 8.4<br>2501.9 | 15 | | | | | | |
| 10<br>2500.3 | | | 93 | | 3 - 4 - 8 | | | | 23 | | | | | | |
| | | | 100 | | 11 - 18 - 25 | | Occasional brown organics at 12'. | | 18 | | | | | | |
| 15<br>2495.3 | | | 100 | | 4 - 9 - 20 | | | | 20 | | | | | | |
| | | | | | | | Boring Depth: 16.0 ft, *Elevation: 2494.3 ft* | 16.0<br>2494.3 | | | | | | | |

| Water Level Observations | | |
|---|---|---|
| ▽ End of Drilling: **12.7 ft** *(2497.6 ft), Augers In* | ▽ During Drilling: **4.0 ft** *(2506.3 ft)*<br>▼ After Drilling: **5.0 ft** *(2505.3 ft) +0.25 hrs, Augers Out* | Remarks: WL=4.15' after 45 minutes |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:42 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-4**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138571.9 ft<br>**Coordinates** E: 2787395.5 ft | **Station:** 1814 + 97<br>**Offset:** 2 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2506.8 ft |
| **Date Started:**<br>2/1/22 | **Date Finished:**<br>2/1/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Helgerson<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 43E 11 - DD<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lean CLAY (CL), moist, grayish brown, [A-6]. | | | | | | | | Hollow stem augers with finger bit. |
| | | | | | | | | 3.0<br>*2503.8* | 24 | | | | | | |
| | | | 60 | | WH - 1 - 2 | | Clayey SAND (SC), very loose, wet, grayish brown, fine to coarse grained, subangular to subrounded, [A-2]. | | 18 | | | | | | |
| 5<br>*2501.8* | | | | | | | | 5.0<br>*2501.8* | | | | | | | |
| | | | 87 | | 2 - 2 - 4 | | Sandy SILT (ML), wet, grayish brown, [A-4]. | 5.6<br>*2501.2* | 23 | | | | | | |
| | | | | | | | CLAYSTONE, light gray to gray, soft to very soft field hardness. Light brown to tan siltstone layer 7.5'-8.2'. | | 17 | | | | | | |
| | | | 100 | | 12 - 18 - 23 | | | | 25 | | | | | | |
| 10<br>*2496.8* | | | | | | | | | 21 | | | | | | |
| | | | 97 | | 8 - 8 - 5 | | Occasional iron oxide staining at 10'. | | 18 | | | | | | |
| | | | | | | | | 11.5<br>*2495.3* | | | | | | | |

Boring Depth: 11.5 ft, *Elevation: 2495.3 ft*

| Water Level Observations | |
|---|---|
| ▽ During Drilling: **2.7 ft** ***(2504.1 ft)*** | Remarks: |
| ▼ End of Drilling: **10.8 ft** ***(2496.0 ft), Augers In*** | ▼ After Drilling: **3.0 ft** ***(2503.8 ft) +0.25 hrs, Augers Out*** |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:42 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-5**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138686.7 ft<br>**Coordinates** E: 2789721.9 ft | **Station:** 1838 + 27<br>**Offset:** 21 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2559.6 ft |
| **Date Started:**<br>2/1/22 | **Date Finished:**<br>2/1/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Helgerson<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 43E 12 - CD<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILT (ML), medium dense, moist, light brown to gray, [A-4]. Frequent iron oxide staining with depth. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 100 | | 5 - 10 - 15 | | | | 15 | | | | | | |
| 5<br>2554.6 | | | 100 | | 9 - 14 - 14 | | | | 10 | | | | | | |
| | | | 100 | | 8 - 6 - 4 | | Silty SAND (SM), loose, moist, light brown to tan, [A-4]. Occasional iron oxide staining with depth. | 7.5<br>2552.1<br>8.9<br>2550.7 | 7<br>21 | | NP | 43 | | | |
| 10<br>2549.6 | | | 97 | | 3 - 5 - 7 | | Shaley CLAYSTONE, gray to light brown, soft to very soft field hardness. Frequent iron oxide stained fracture faces. Classifies as CH / A-7 when mechanically processed. | | 21 | 53 | 28 | 95 | | | |
| | | | 83 | | 6 - 10 - 12 | | | | 19 | | | | | | |
| | | | | | | | COAL, black. Frequent white evaporite. | 13.9<br>2545.7 | 43 | | | | | | |
| 15<br>2544.6 | | | 100 | | 2 - 11 - 23 | | Shaley CLAYSTONE, gray to light brown, soft to very soft field hardness. Frequent brown to maroon speckling. | 15.5<br>2544.1 | 68<br>12 | | | | | | |
| | | | | | | | SILTSTONE, light brown to gray, very soft field hardness. Poorly lithified. Occasional iron oxide staining. | 18.5<br>2541.1 | | | | | | | |
| 20<br>2539.6 | | | 100 | | 9 - 16 - 33 | | | | 12 | | | | | | |
| | | | | | | | Boring Depth: 21.5 ft, *Elevation: 2538.1 ft* | 21.5<br>2538.1 | | | | | | | |

| Water Level Observations | | Remarks: Boring cave-in depth not measured. |
|---|---|---|
| End of Drilling: Not Encountered, Augers In | During Drilling: Not Encountered<br>After Drilling: Not Encountered, Augers Out | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:42 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-6**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138736.2 ft<br>**Coordinates** E: 2791350.8 ft | **Station:** 1854 + 56<br>**Offset:** 21 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2508.6 ft |
| **Date Started:**<br>2/10/22 | **Date Finished:**<br>2/10/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Helgerson<br>**Logger:** Kettner | **Notes:** | | | **PLS TRS-QQ:** 18N 43E 12 - DC<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILT (ML), very loose, moist, gray, [A-4]. Frequent lean clay layers/seams. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 0 | | WH - WH - WH | | | | 30 | | | | | | |
| 5<br>2503.6 | | | 100 | | | | | | 30 | | NP | 94 | | | |
| | | | 50 | | WH - WH - WH | | | | 24 | | | | | | |
| 10<br>2498.6 | | | 100 | | | | | | 19 | 28 | 19 | 97 | | | |
| | | | 50 | | WH - WH - 2 | | | | 20 | | | | | | |
| 15<br>2493.6 | | | 75 | | WH - WH - 2 | | | | 23 | | | | | | |
| | | | | | | | Trace sand and coal fragments at 18'. | | | | | | | | |
| 20<br>2488.6 | | | 100 | | WH - WH - 3 | | | | 28 | | NP | 91 | | | |
| | | | | | | | Shaley CLAYSTONE, gray, very soft to soft field hardness. Frequent iron oxide staining. | 23.0<br>2485.6 | | | | | | | |
| 25<br>2483.6 | | | 100 | | 5 - 11 - 18 | | | | | | | | | | |
| | | | | | | | SILTSTONE, gray, very soft to soft field hardness. | 27.0<br>2481.6 | | | | | | | |
| 30<br>2478.6 | | | 100 | | 10 - 21 - 30 | | | | | | | | | | |
| | | | | | | | Boring Depth: 31.5 ft, *Elevation: 2477.1 ft* | 31.5<br>2477.1 | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 26' after augers removed. |
|---|---|---|
| End of Drilling: Not Encountered, Augers In | After Drilling: Not Encountered, Augers Out | |

During Drilling: Not Encountered

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:42 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-7**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138774 ft<br>**Coordinates** E: 2794490.1 ft | **Station:** 1885 + 96<br>**Offset:** 3 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2456.6 ft |
| **Date Started:**<br>1/19/22 | **Date Finished:**<br>1/20/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Helgerson<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 18 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Sandy SILT (ML), very loose, moist, light brown, [A-4]. Trace thin roots. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 90 | | 1 - 1 - 2 | | | | 16 | | | | | | |
| 5<br>2451.6 | | | | | | | | 5.3<br>2451.3 | 20 | | | | | | |
| | | | 90 | | 1 - 5 - 4 | | Silty SAND (SM), loose, moist, light brown, fine grained, [A-2]. | | 14 | | | | | | |
| | | | | | | | Clayey SAND with gravel (SC), loose, moist to wet, grayish brown, fine to coarse grained, subangular to subrounded, [A-2]. | 7.0<br>2449.6 | | | | | | | |
| | | | 60 | | 3 - 4 - 3 | | | | 15 | | | | | | |
| 10<br>2446.6 | | | | | | | Sandy SILT (ML), very loose, wet, grayish brown, [A-4]. Occasional thin fine-grained sand layers. | 9.5<br>2447.1 | | | NP | 60 | | | |
| | | | 80 | | WH - WH - 3 | | | | | | | | | | |
| | | | | | | | | | 27 | | | | | | |
| | | | 70 | | 2 - 5 - 5 | | Silty SAND with gravel (SM), loose, wet, brown, fine to coarse grained, subangular to subrounded, [A-1]. Occasional clinker. Grayish brown with increased clay content with depth. | 13.0<br>2443.6 | | | | | | | |
| 15<br>2441.6 | | | | | | | | | | | NP | 22 | | | |
| | | | 45 | | 3 - 3 - 6 | | | | | | | | | | |
| | | | | | | | SILTSTONE, gray, very soft field hardness. Very poorly lithified. Occasional thin gray claystone layers. | 18.0<br>2438.6 | | | | | | | |
| 20<br>2436.6 | | | | | | | | | | | | | | | |
| | | | 95 | | 10 - 10 - 24 | | | | 17 | | | | | | |
| 25<br>2431.6 | | | | | | | Occasional black coal fragments at 25'. | | | | | | | | |
| | | | 95 | | 10 - 20 - 26 | | | | 21 | | | | | | |
| 30 | | | | | | | | | | | | | | | |
| 2426.6 | | | | | | | | | | | | | | | |

| Water Level Observations | | |
|---|---|---|
| End of Drilling: | During Drilling: 7.5 ft (2449.1 ft) | Remarks: Water levels not measured at End of Drilling or After Drilling. |
| | After Drilling: | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:42 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-7**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138774 ft<br>**Coordinates** E: 2794490.1 ft | **Station:** 1885 + 96<br>**Offset:** 3 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2456.6 ft |
| **Date Started:**<br>1/19/22 | **Date Finished:**<br>1/20/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Helgerson<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 18 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 50/0.4ft | | COAL, black. | 30.0<br>*2426.6* | 63 | | | | | | |
| | | | | | | | SILTSTONE, gray, very soft field hardness. Very poorly lithified. | 30.4<br>*2426.2* | | | | | | | |
| 35<br>*2421.6* | | | 95 | | 7 - 11 - 15 | | | | 21 | | | | | | |
| | | | | | | | | 36.5<br>*2420.1* | | | | | | | |

Boring Depth: 36.5 ft, *Elevation: 2420.1 ft*

| Water Level Observations | | |
|---|---|---|
| End of Drilling: | During Drilling: **7.5 ft** ***(2449.1 ft)*** | Remarks: Water levels not measured at End of Drilling or After Drilling. |
| | After Drilling: | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:42 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-8**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138788 ft<br>**Coordinates** E: 2794939.6 ft | **Station:** 1890 + 46<br>**Offset:** 6 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2454.0 ft |
| **Date Started:**<br>2/8/22 | **Date Finished:**<br>2/9/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Helgerson<br>**Logger:** Jaynes | **Notes:** Timber Creek west abutment. | | | **PLS TRS-QQ:** 18N 44E 18 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lean CLAY (CL), moist, light brown, [A-6]. Trace fine sand. | | | | | | | | Hollow stem augers with finger bit. |
| | | | | | | | | 2.8<br>*2451.2* | 17 | | | | | | |
| 5<br>*2449.0* | | | 83 | | WH - WH - WH | | Sandy SILT (ML), very loose, moist to wet, light brown, [A-4]. | | 16 | | | | | | |
| | | | 87 | | WH - 2 - 1 | | | | | | | | | | |
| | | | 100 | | WH - WH - WH | | Occasional thin lean clay layers at 7.5'. | | | | | | | | |
| 10<br>*2444.0* | | | 93 | | WH - 2 - 1 | | Brownish gray at 11'. | | | | | | | | VSTA: 1167 psf<br>VSTRESID: 283 psf |
| | | | | | | | Silty SAND with gravel (SM), very loose, wet, brownish gray, fine to coarse grained, subangular to subrounded, [A-2]. | 11.2<br>*2442.8* | 27 | | | | | | |
| | | | 90 | | 2 - 4 - 9 | | SILTSTONE, blue-gray, very soft field hardness. Classifies as ML / A-4 when mechanically processed. Claystone layer 15.7'-16'. | 12.8<br>*2441.2* | 22 | | NP | 94 | | | ~12" sand heave prior to SPT. |
| 15<br>*2439.0* | | | 100 | | 6 - 8 - 15 | | | | 15 | | | | | | |
| 20<br>*2434.0* | | | 100 | | 9 - 17 - 21 | | | | 22 | | | | | | |
| 25<br>*2429.0* | | | 100 | | 14 - 19 - 20 | | | | 24 | | | | | | 25': Switched to HQ coring with surface set bit and water. |
| | | | 100 | 25 | | | | | | | | | | | |
| 30<br>*2424.0* | | | | | | | COAL, black. | 29.3<br>*2424.7* | | | | | | | |
| | | | | | | | CLAYSTONE, dark gray, very soft to soft field hardness. | 29.7<br>*2424.3*<br>30.0 | | | | | 102<br>198<br>154 | 109<br>117<br>117 | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:42 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

| Water Level Observations | | |
|---|---|---|
| ▽ End of Drilling: | ▽ During Drilling: **5.5 ft** *(2448.5 ft)*<br>▼ After Drilling: | Remarks: Water levels not measured at End of Drilling or After Drilling due to coring operations. |

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-8**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138788 ft<br>**Coordinates** E: 2794939.6 ft | **Station:** 1890 + 46<br>**Offset:** 6 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2454.0 ft |
| **Date Started:**<br>2/8/22 | **Date Finished:**<br>2/9/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Helgerson<br>**Logger:** Jaynes | **Notes:** Timber Creek west abutment. | | | **PLS TRS-QQ:** 18N 44E 18 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2424.0 | | | | | | | |
| | | | 88 | 52 | | | SILTSTONE, light gray, very soft field hardness. Poorly lithified. | 32.9<br>2421.1 | | | | | | | |
| | | | | | | | COAL, black. | | | | | | | | |
| 35<br>2419.0 | | | | | | | | 35.2<br>2418.8 | | | | | 183 | 123 | |
| | | | | | | | CLAYSTONE, dark brown to black, very soft to soft field hardness. Brownish gray with frequent black coal speckling at 35.5'. | | | | | | 299 | 122 | |
| | | | 100 | 48 | | | Blue-gray at 37'. | | | | | | 66 | 119 | |
| | | | | | | | | | | | | | 150 | 119 | |
| | | | | | | | SILTSTONE, light gray, very soft field hardness. Poorly lithified. | 38.5<br>2415.5 | | | | | | | |
| 40<br>2414.0 | | | | | | | | | | | | | 77 | 112 | |
| | | | | | | | CLAYSTONE, brownish gray, very soft to soft field hardness. Frequent black coal speckling. | 40.3<br>2413.7 | | | | | | | |
| | | | 93 | 25 | | | | 40.9<br>2413.1 | | | | | | | |
| | | | | | | | COAL, black. | 42.9<br>2411.1 | | | | | 31 | 111 | |
| | | | | | | | CLAYSTONE, brownish gray, very soft to soft field hardness. Frequent black coal speckling. | | | | | | 31 | 112 | |
| 45<br>2409.0 | | | | | | | | | | | | | 72 | 114 | |
| | | | | | | | | | | | | | 34 | 114 | |
| | | | | | | | | | | | | | 4 | 117 | |
| | | | 98 | 85 | | | | | | | | | 52 | 118 | |
| | | | | | | | SILTSTONE, blue-gray, very soft field hardness. Poorly lithified. Light gray with increased lithification at depth. | 48.0<br>2406.0 | | | | | 254 | 122 | |
| 50<br>2404.0 | | | | | | | | 50.0<br>2404.0 | | | | | | | |

Boring Depth: 50.0 ft, *Elevation: 2404.0 ft*

| Water Level Observations | | |
|---|---|---|
| End of Drilling: | During Drilling: **5.5 ft** *(2448.5 ft)* | Remarks: Water levels not measured at End of Drilling or After Drilling due to coring operations. |
| | After Drilling: | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:42 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-9**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138796.3 ft<br>**Coordinates** E: 2795126.1 ft | **Station:** 1892 + 32<br>**Offset:** 6 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2455.3 ft |
| **Date Started:**<br>2/9/22 | **Date Finished:**<br>2/10/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Helgerson<br>**Logger:** Jaynes | **Notes:** Timber Creek east abutment. | | | **PLS TRS-QQ:** 18N 44E 18 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lean CLAY (CL), very soft, moist, light brown to tan, [A-6]. Frequent thin roots. | | 21 | | | | | | Hollow stem augers with finger bit. |
| | | | 80 | | WH - WH - 2 | | | 3.5 / 2451.8 | | | | | | | |
| 5 / 2450.3 | | | 90 | | 2 - 2 - 3 | | Silty SAND (SM), loose, moist to wet, light brown, fine grained, [A-2]. | | 20 | | | | | | |
| | | | | | | | | 6.8 | 24 | | | | | | |
| | | | 67 | | 2 - 3 - 2 | | Clayey SAND with gravel (SC), loose, wet, light brown, fine to coarse grained, subangular to angular, [A-6]. | 2448.5 | 16 | | | | | | |
| | | | | | | | | 9.0 | | | | | | | |
| 10 / 2445.3 | | | 97 | | 2 - 4 - 8 | | SILTSTONE, light gray, very soft field hardness. Occasional iron oxide staining. Classifies as ML / A-4 when mechanically processed. Thin black coal seams 11.5'-14'. | 2446.3 | 25 | | NP | 85 | | | |
| | | | 100 | | 12 - 15 - 12 | | | | 21 | | | | | | |
| 15 / 2440.3 | | | 100 | | 11 - 18 - 27 | | Blue-gray at 14'. | | 16 | | | | 37 | 116 | 14': Switched to HQ coring with surface set bit and water. |
| | | | 87 | 19 | | | Light brown to tan, hard to very hard shale 17.3'-17.4'. | | 16 | | | | | | |
| | | | | | | | | 19.2 | | | | | | | |
| 20 / 2435.3 | | | | | | | CLAYSTONE, dark gray, very soft to soft field hardness. | 2436.1 | | | | | 125 | 117 | |
| | | | | | | | | 20.8 | | | | | | | |
| | | | 78 | 48 | | | SILTSTONE, blue-gray, very soft field hardness. Classifies as ML / A-4 when mechanically processed. | 2434.5 | | | NP | 55 | | |
| 25 / 2430.3 | | | | | | | | | | | | | | | |
| | | | 48 | 18 | | | | | | | | | | | |
| | | | | | | | Light gray with occasional black coal fragments at 29'. Spherical iron concretions at 30.2'. | | | | | | | | |
| 30 / 2425.3 | | | | | | | | 30.3 | | | | | | | |
| | | | | | | | COAL, black. | 2425.0 | | | | | 131 | 117 | |
| | | | 81 | 33 | | | CLAYSTONE, dark gray, very soft to soft | 30.7 | | | | | | | |

| Water Level Observations | | |
|---|---|---|
| End of Drilling: | During Drilling: 6.6 ft (2448.7 ft) | Remarks: Water levels not measured at End of Drilling or After Drilling due to coring operations. |
| | After Drilling: | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:42 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-9**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138796.3 ft<br>**Coordinates** E: 2795126.1 ft | **Station:** 1892 + 32<br>**Offset:** 6 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2455.3 ft |
| **Date Started:**<br>2/9/22 | **Date Finished:**<br>2/10/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Helgerson<br>**Logger:** Jaynes | **Notes:** Timber Creek east abutment. | | | **PLS TRS-QQ:** 18N 44E 18 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | field hardness. Frequent black coal fragments. | 2424.6<br>31.1<br>2424.2 | | | | | | | |
| 35<br>2420.3 | | | | | | | SILTSTONE, light gray to blue-gray, very soft field hardness. Occasional black coal fragments. | 35.0<br>2420.3 | | | | | 27<br>60 | 106<br>107 | |
| | | | 89 | 58 | | | CLAYSTONE, gray, very soft to soft field hardness. Frequent black coal fragments. | | | | | | 111 | 114 | |
| | | | | | | | COAL, black. | 37.3<br>2418.0 | | | | | | | |
| 40<br>2415.3 | | | | | | | CLAYSTONE, dark gray to blue-gray, very soft to soft field hardness. Frequent black coal fragments. | 39.7<br>2415.6 | | | | | 158 | 119 | |
| | | | 93 | 78 | | | SILTSTONE, blue-gray, very soft field hardness. Dark gray claystone layer 44.7'-44.8'. | 42.4<br>2412.9 | | | | | 19<br>93 | 114<br>111 | |
| 45<br>2410.3 | | | | | | | COAL, black. | 44.8<br>2410.5 | | | | | | | |
| | | | 29 | 0 | | | | 47.5<br>2407.8 | | | | | | | |

Boring Depth: 47.5 ft, *Elevation: 2407.8 ft*

| Water Level Observations | | |
|---|---|---|
| End of Drilling: | During Drilling: **6.6 ft** ***(2448.7 ft)*** | Remarks: Water levels not measured at End of Drilling or After Drilling due to coring operations. |
| | After Drilling: | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-10**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138770.7 ft<br>**Coordinates** E: 2795839 ft | **Station:** 1899 + 44<br>**Offset:** 48 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2522.6 ft |
| **Date Started:**<br>12/21/21 | **Date Finished:**<br>12/21/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 18 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILTSTONE, gray, very soft field hardness. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 100 | | 5 - 7 - 9 | | | | 23 | | | | | | |
| 5<br>2517.6 | | | 100 | | 7 - 8 - 12 | | | | 15 | | | | | | |
| | | | 100 | | 11 - 19 - 18 | | Silty SANDSTONE, gray to tan, fine grained, very soft field hardness. Poorly cemented. Occasional iron oxide staining. | 7.9<br>2514.7 | 8 | | | | | | |
| 10<br>2512.6 | | | 100 | | 9 - 7 - 5 | | | | 4 | | | | | | |
| | | | | | | | SILTSTONE, gray, very soft field hardness. Frequent iron oxide staining. Occasional coal seams. | 11.2<br>2511.4 | | | | | | | |
| | | | 100 | | 9 - 19 - 26 | | | | 12 | | | | | | |
| 15<br>2507.6 | | | 100 | | 8 - 21 - 40 | | | | 17 | | | | | | |
| | | | | | | | Silty SANDSTONE, gray, fine grained, very soft field hardness. Poorly cemented. | 19.0<br>2503.6 | | | | | | | |
| 20<br>2502.6 | | | 100 | | 17 - 32 - 44 | | | | 5 | | | | | | |
| | | | | | | | Sandy SILTSTONE, gray, very soft field hardness. Frequent iron oxide staining. | 24.2<br>2498.4 | | | | | | | |
| 25<br>2497.6 | | | 100 | | 12 - 33 - 50 | | | | 14 | | | | | | |
| 30 | | | | | | | | | | | | | | | |
| 2492.6 | | | | | | | | | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 36' after augers removed. |
|---|---|---|
| ▽ During Drilling: Not Encountered | | |
| ▼ End of Drilling: Not Encountered, Augers In | ▼ After Drilling: Not Encountered, Augers Out | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-10**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138770.7 ft<br>**Coordinates** E: 2795839 ft | **Station:** 1899 + 44<br>**Offset:** 48 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2522.6 ft |
| **Date Started:**<br>12/21/21 | **Date Finished:**<br>12/21/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 18 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 14 - 31 - 50/0.4ft | | | | 12 | | | | | | |
| | | | | | | | COAL, black. | 33.8<br>2488.8 | | | | | | | |
| 35<br>2487.6 | | | 100 | | 18 - 25 - 20 | | Sandy SILTSTONE, gray, very soft field hardness. Frequent iron oxide staining. | 34.5<br>2488.1 | 11 | | | | | | |
| | | | | | | | CLAYSTONE, gray, very soft field hardness. Frequent iron oxide staining. | 38.0<br>2484.6 | | | | | | | |
| 40<br>2482.6 | | | 100 | | 11 - 21 - 48 | | Sandy SILTSTONE, gray, very soft field hardness. Occasional silty sandstone layers. | 40.8<br>2481.8 | 18 | | | | | | |
| | | | | | | | COAL, black. | 41.9<br>2480.7 | | | | | | | |
| | | | | | | | Sandy SILTSTONE, gray, very soft field hardness. Occasional silty sandstone layers. | 42.8<br>2479.8 | | | | | | | |
| 45<br>2477.6 | | | 100 | | 12 - 23 - 29 | | | | 17 | | | | | | |
| | | | | | | | COAL, black. | 46.5<br>2476.1 | | | | | | | |
| | | | | | | | Shaley CLAYSTONE, gray, very soft field hardness. | 47.0<br>2475.6 | | | | | | | |
| 50<br>2472.6 | | | 100 | | 29 - 28 - 40 | | | | 16 | | | | | | |
| | | | | | | | Boring Depth: 51.5 ft, *Elevation: 2471.1 ft* | 51.5<br>2471.1 | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 36' after augers removed. |
|---|---|---|
| End of Drilling: Not Encountered, Augers In | During Drilling: Not Encountered<br>After Drilling: Not Encountered, Augers Out | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-11**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138900.8 ft<br>**Coordinates** E: 2797592.3 ft | **Station:** 1917 + 01<br>**Offset:** 10 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2474.4 ft |
| **Date Started:**<br>12/22/21 | **Date Finished:**<br>12/22/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 18 - AA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILT (ML), medium dense to very loose, moist, tan, [A-4]. Frequent lean clay content. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 75 | | 4 - 7 - 9 | | | | 8 | | | | | | |
| 5<br>2469.4 | | | 100 | | 4 - 3 - 3 | | | | 12 | | | | | | |
| | | | 75 | | 2 - 1 - 2 | | | | 18 | | NP | 95 | | | |
| 10<br>2464.4 | | | 75 | | WH - WH - WH | | | | 19 | | | | | | |
| | | | 75 | | WH - WH - 2 | | | | 16 | | | | | | |
| | | | | | | | Sandy SILT (ML), very loose, moist, tan, [A-4]. | 14.0<br>2460.4 | | | | | | | |
| 15<br>2459.4 | | | 75 | | 2 - 1 - 2 | | | | 13 | | NP | 52 | | | |
| 20<br>2454.4 | | | 100 | | WH - 2 - 1 | | | | 21 | | | | | | |
| | | | | | | | Silty SAND with gravel (SM), loose, moist to wet, multi-colored, fine to coarse grained, [A-1]. | 24.0<br>2450.4 | | | | | | | |
| 25<br>2449.4 | | | 75 | | 2 - 3 - 2 | | | | | | NP | 17 | | | |
| | | | | | | | Boring Depth: 26.5 ft, *Elevation: 2447.9 ft* | 26.5<br>2447.9 | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 19' after augers removed. |
|---|---|---|
| End of Drilling: **25.5 ft** ***(2448.9 ft) +0.5 hrs. Augers In*** | During Drilling: **25.8 ft** ***(2448.6 ft)*** | |
| | After Drilling: **Not Encountered** | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-12**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138963.5 ft<br>**Coordinates** E: 2799276.2 ft | **Station:** 1933 + 86<br>**Offset:** 4 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2464.1 ft |
| **Date Started:**<br>10/19/21 | **Date Finished:**<br>10/19/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** Skull Creek west abutment. | | | **PLS TRS-QQ:** 18N 44E 17 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILT (ML), very loose, dry to moist, tan to brown, [A-4]. Trace sand and gravel. Frequent lean clay content. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 75 | | 3 - 2 - 2 | | | | 9 | | | | | | |
| 5<br>2459.1 | | | 50 | | 2 - 2 - 1 | | | | 18 | | | | | | |
| | | | | | | | | 7.0<br>2457.1 | | | | | | | |
| | | | 75 | | 2 - 3 - 2 | | Sandy SILT (ML), loose, moist, tan to brown, fine grained, [A-4]. | | 11 | | | | | | |
| 10<br>2454.1 | | | | | | | | 9.5<br>2454.6 | | | | | | | |
| | | | 100 | | 7 - 10 - 10 | | Sandy, Silty GRAVEL (GM), medium dense, moist, tan to brown, fine to coarse grained, subrounded to angular, [A-1]. Frequent iron oxide staining. | | 9 | | | | | | |
| | | | 100 | | 4 - 3 - 10 | | SILT (ML), medium dense, moist, tan to brown, [A-4]. Trace sand. Frequent lean clay content. | 12.8<br>2451.3 | 23 | | | 87 | | | |
| 15<br>2449.1 | | | 75 | | 5 - 6 - 6 | | Shaley CLAYSTONE, gray to tan, very soft field hardness. Occasional siltstone layer. | 14.0<br>2450.1 | 23 | | | | | | |
| 20<br>2444.1 | | | 100 | | 20 - 22 - 29 | | Sandy SILTSTONE, gray, very soft field hardness. Poorly lithified. | 19.5<br>2444.6 | 23 | | | | | | |
| 25<br>2439.1 | | | 100 | | 16 - 23 - 30 | | | | 22 | | | | | | |
| 30 | | | | | | | | | | | | | | | |
| 2434.1 | | | | | | | | | | | | | | | |

**Water Level Observations**

During Drilling: **19.0 ft** *(2445.1 ft)*

End of Drilling:

After Drilling:

Remarks: Water levels not measured at End of Drilling or After Drilling due to coring operations.

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-12**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138963.5 ft<br>**Coordinates** E: 2799276.2 ft | **Station:** 1933 + 86<br>**Offset:** 4 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2464.1 ft |
| **Date Started:**<br>10/19/21 | **Date Finished:**<br>10/19/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** Skull Creek west abutment. | | | **PLS TRS-QQ:** 18N 44E 17 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 35 - 50/0.2ft | | COAL, black. | 30.0<br>2434.1 | 52 | | | | | | 30': Switched to HQ coring with surface set bit and water. |
| | | | 80 | 23 | | | | | 52 | | | | | | |
| 35<br>2429.1 | | | | | | | CLAYSTONE, gray, very soft to soft field hardness. | 34.0<br>2430.1 | | | | | 29<br>108<br>23 | 113<br>113<br>104 | |
| | | | | | | | SILTSTONE, gray, very soft field hardness. | 35.6<br>2428.5 | | | | | | | |
| | | | 93 | 28 | | | COAL, black. | 37.3<br>2426.8 | | | | | | | |
| 40<br>2424.1 | | | | | | | Sandy SILTSTONE, gray, very soft field hardness.<br>45 degree fracture at 41.5'. | 41.0<br>2423.1 | | | | | 88<br>110<br>108 | 121<br>120<br>118 | |
| | | | 100 | 52 | | | | | | | | | 168<br>150 | 114<br>115 | |
| 45<br>2419.1 | | | | | | | | | | | | | 101<br>314<br>158 | 112<br>117<br>117 | |
| | | | 90 | 55 | | | 1" coal seam at 47.5'. | | | | | | 184<br>163 | 116<br>120 | |
| 50<br>2414.1 | | | | | | | Silty SANDSTONE, gray, fine grained, very soft to hard field hardness. | 51.5<br>2412.6 | | | | | | | |
| | | | 35 | 23 | | | | | | | | | 11920<br>11406 | 160<br>160 | |
| 55<br>2409.1 | | | | | | | Sandy SILTSTONE, gray, very soft to soft field hardness. | 54.7<br>2409.4 | | | | | 63<br>101 | 116<br>118 | |
| | | | 72 | 25 | | | | | | | | | | | |
| 60 | | | | | | | CLAYSTONE, gray, very soft to soft field | 59.2<br>2404.9 | | | | | | | |
| 2404.1 | | | | | | | | | | | | | | | |

**Water Level Observations**

During Drilling: **19.0 ft** *(2445.1 ft)*

End of Drilling:

After Drilling:

Remarks: Water levels not measured at End of Drilling or After Drilling due to coring operations.

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-12**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138963.5 ft<br>**Coordinates** E: 2799276.2 ft | **Station:** 1933 + 86<br>**Offset:** 4 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2464.1 ft |
| **Date Started:**<br>10/19/21 | **Date Finished:**<br>10/19/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** Skull Creek west abutment. | | | **PLS TRS-QQ:** 18N 44E 17 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | hardness. | | | | | | | | |
| | | | | | | | Sandy SILTSTONE, gray, very soft to soft field hardness. | 61.0 / 2403.1 | | | | | 324<br>116<br>192<br>35 | 117<br>120<br>115<br>111 | |
| | | | 100 | 52 | | | | | | | | | | | |
| 65 / 2399.1 | | | | | | | Silty SANDSTONE, gray, fine grained, very soft field hardness. Poorly cemented. Occasional coal seam. | 64.4 / 2399.7 | | | | | | | |
| | | | 30 | 0 | | | | | | | | | | | |
| 70 / 2394.1 | | | | | | | | | | | | | | | |
| | | | 68 | 0 | | | | | | | | | | | |
| 75 / 2389.1 | | | | | | | | 75.0 / 2389.1 | | | | | | | |

Boring Depth: 75.0 ft, *Elevation: 2389.1 ft*

| Water Level Observations | | |
|---|---|---|
| End of Drilling: | During Drilling: **19.0 ft** ***(2445.1 ft)*** | Remarks: Water levels not measured at End of Drilling or After Drilling due to coring operations. |
| | After Drilling: | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-13**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138968.1 ft<br>**Coordinates** E: 2799448.6 ft | **Station:** 1935 + 58<br>**Offset:** 2 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2455.3 ft |
| **Date Started:**<br>10/20/21 | **Date Finished:**<br>10/20/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** Skull Creek east abutment. | | | **PLS TRS-QQ:** 18N 44E 17 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Sandy SILT (ML), very loose, moist to wet, tan to brown, [A-4]. Trace lean clay. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 75 | | 2 - 1 - 1 | | | | 18 | | | | | | |
| 5<br>2450.3 | | | 50 | | WH - WH - WH | | | | | | | | | | |
| | | | 0 | | WH - WH - WH | | | | | | | | | | |
| 10<br>2445.3 | | | 25 | | 1 - 1 - 2 | | Poorly-Graded SAND with gravel (SP), very loose, wet, tan to brown, fine to coarse grained, angular to subangular, [A-2]. | 10.4<br>2444.9 | | | | | | | |
| | | | 100 | | 8 - 18 - 32 | | SILTSTONE, gray, very soft field hardness. | 12.7<br>2442.6 | 20 | | | | | | |
| 15<br>2440.3 | | | 100 | | 12 - 24 - 48 | | Sand seam at 16.2'. | | 21 | | | | | | 15': Switched to HQ coring with surface set bit and water. |
| | | | 100 | 30 | | | | | 21 | | | | | | |
| | | | | | | | | | | | | | 158 | 113 | |
| 20<br>2435.3 | | | | | | | | | | | | | 162 | 114 | |
| | | | 80 | 13 | | | | | | | | | | | |
| 25<br>2430.3 | | | | | | | COAL, black. | 25.8<br>2429.5 | | | | | | | |
| | | | 100 | 30 | | | | | | | | | | | |
| 30<br>2425.3 | | | | | | | CLAYSTONE, gray, very soft field hardness. | 29.8<br>2425.5 | | | | | 49 | 105 | |
| | | | | | | | SILTSTONE, gray, very soft field hardness. | 30.0 | | | | | | | |

| Water Level Observations | | |
|---|---|---|
| End of Drilling: | During Drilling: 6.0 ft *(2449.3 ft)* | Remarks: Water levels not measured at End of Drilling or After Drilling due to coring operations. |
| | After Drilling: | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-13**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138968.1 ft<br>**Coordinates** E: 2799448.6 ft | **Station:** 1935 + 58<br>**Offset:** 2 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2455.3 ft |
| **Date Started:**<br>10/20/21 | **Date Finished:**<br>10/20/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** Skull Creek east abutment. | | | **PLS TRS-QQ:** 18N 44E 17 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2425.3 | | | | | 27 | 107 | |
| | | | 100 | 47 | | | | | | | | | 58 | 112 | |
| | | | | | | | | 33.9 | | | | | | | |
| 35 | | | | | | | COAL, black. | 2421.4 | | | | | | | |
| 2420.3 | | | | | | | | 36.6 | | | | | | | |
| | | | 100 | 50 | | | SILTSTONE, gray, very soft field hardness. | 2418.7 | | | | | 233 | 112 | |
| | | | | | | | | | | | | | 96 | 118 | |
| 40 | | | | | | | | | | | | | 42 | 110 | |
| 2415.3 | | | | | | | | | | | | | 219 | 117 | |
| | | | | | | | | | | | | | 141 | 114 | |
| | | | | | | | 1" coal seam at 41.5'. | | | | | | 101 | 114 | |
| | | | 100 | 63 | | | | | | | | | 145 | 117 | |
| | | | | | | | | | | | | | 200 | 119 | |
| | | | | | | | | | | | | | 102 | 118 | |
| 45 | | | | | | | | | | | | | 400 | 119 | |
| 2410.3 | | | | | | | | | | | | | | | |
| | | | 7 | 0 | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | | | |
| 2405.3 | | | | | | | | | | | | | 25 | 106 | |
| | | | | | | | | | | | | | 26 | 116 | |
| | | | 100 | 72 | | | | | | | | | 105 | 115 | |
| | | | | | | | | | | | | | 70 | 113 | |
| | | | | | | | | | | | | | 41 | 105 | |
| 55 | | | | | | | | | | | | | 99 | 108 | |
| 2400.3 | | | | | | | Boring Depth: 55.0 ft, *Elevation: 2400.3 ft* | 55.0<br>2400.3 | | | | | | | |

| Water Level Observations | | Remarks: Water levels not measured at End of Drilling or After Drilling due to coring operations. |
|---|---|---|
| End of Drilling: | During Drilling: 6.0 ft *(2449.3 ft)*<br>After Drilling: | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-14**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139021.8 ft<br>**Coordinates** E: 2800383.6 ft | **Station:** 1944 + 95<br>**Offset:** 18 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2502.4 ft |
| **Date Started:**<br>10/14/21 | **Date Finished:**<br>10/14/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 17 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 75 | | 2 - 3 - 3 | | FILL, Sandy SILT (ML), loose, dry to moist, tan to brown, fine grained, [A-4]. | | 18 | | | | | | Hollow stem augers with finger bit. |
| 5<br>2497.4 | | | 75 | | 3 - 2 - 2 | | SILT (ML), very loose to medium dense, moist, tan to gray, [A-4]. Frequent lean clay content.<br>Less clay content 6'-12'. | 3.8<br>2498.6 | 22 | | | 92 | | | |
| | | | 100 | | 3 - 4 - 7 | | | | 15 | | | 88 | | | |
| 10<br>2492.4 | | | 100 | | 6 - 9 - 13 | | | | 19 | | | | | | |
| | | | 100 | | 7 - 12 - 15 | | SILTSTONE, tan, very soft field hardness. Interbedded with shaley claystone. | 12.0<br>2490.4 | 19 | | | | | | |
| 15<br>2487.4 | | | 100 | | 7 - 13 - 16 | | | | 22 | | | | | | |
| | | | | | | | CLAYSTONE, tan to gray, very soft field hardness. Frequent iron oxide staining. | 18.0<br>2484.4 | | | | | | | |
| 20<br>2482.4 | | | 75 | | 7 - 7 - 9 | | | | 22 | | | | | | |
| | | | | | | | Shaley CLAYSTONE, tan to gray, very soft field hardness. | 23.0<br>2479.4 | | | | | | | |
| 25<br>2477.4 | | | 100 | | 14 - 23 - 31 | | | | 15 | | | | | | |
| | | | | | | | CLAYSTONE, gray, very soft field hardness. Frequent iron oxide staining. Interbedded with shaley claystone. | 28.0<br>2474.4 | | | | | | | |
| 30 | | | | | | | | | | | | | | | |
| 2472.4 | | | | | | | | | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 20.7' after augers removed. |
|---|---|---|
| ▽ During Drilling: Not Encountered | ▼ End of Drilling: Not Encountered | |
| ▼ After Drilling: Not Encountered | | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-14**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139021.8 ft<br>**Coordinates** E: 2800383.6 ft | **Station:** 1944 + 95<br>**Offset:** 18 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2502.4 ft |
| **Date Started:**<br>10/14/21 | **Date Finished:**<br>10/14/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 17 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 17 - 31 - 50 | | | | 15 | | | | | | |
| 35<br>2467.4 | | | 100 | | 23 - 50/0.3ft | | | 35.8<br>2466.6 | 14 | | | | | | |

Boring Depth: 35.8 ft, *Elevation: 2466.6 ft*

| Water Level Observations | | |
|---|---|---|
| End of Drilling: Not Encountered | During Drilling: Not Encountered | Remarks: Boring caved to 20.7' after augers removed. |
| | After Drilling: Not Encountered | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-15**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139130.5 ft<br>**Coordinates** E: 2803243 ft | **Station:** 1973 + 56<br>**Offset:** 10 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2561.4 ft |
| **Date Started:**<br>10/14/21 | **Date Finished:**<br>10/14/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 17 - AA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lean CLAY (CL), soft to medium stiff, dry to moist, tan to brown, [A-4]. Frequent evaporites. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 50 | | 2 - 2 - 2 | | | | 13 | 27 | 18 | 91 | | | |
| 5<br>2556.4 | | | 50 | | 2 - 3 - 3 | | | | 23 | | | | | | |
| | | | | | | | SILT (ML), medium dense, moist, gray, [A-4]. Frequent lean clay content and evaporites. | 7.0<br>2554.4 | | | | | | | |
| | | | 100 | | 3 - 7 - 8 | | | | 19 | | | | | | |
| 10<br>2551.4 | | | 100 | | 5 - 6 - 7 | | | | 19 | | NP | 85 | | | |
| | | | | | | | CLAYSTONE, gray, very soft field hardness. Frequent evaporites. | 11.5<br>2549.9 | | | | | | | |
| | | | 100 | | 2 - 6 - 7 | | | | 22 | | | | | | |
| 15<br>2546.4 | | | 100 | | 7 - 15 - 19 | | | | 18 | | | | | | |
| | | | | | | | SILTSTONE, gray to tan, very soft field hardness. | 18.0<br>2543.4 | | | | | | | |
| 20<br>2541.4 | | | 100 | | 10 - 17 - 29 | | | | 18 | | | | | | |
| 25<br>2536.4 | | | 100 | | 10 - 23 - 29 | | | | 20 | | | | | | |
| | | | | | | | Boring Depth: 26.5 ft, *Elevation: 2534.9 ft* | 26.5<br>2534.9 | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 18.6' after augers removed. |
|---|---|---|
| End of Drilling: Not Encountered | During Drilling: Not Encountered<br>After Drilling: Not Encountered | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-16**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139141.5 ft<br>**Coordinates** E: 2803882.9 ft | **Station:** 1979 + 96<br>**Offset:** 5 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2527.7 ft |
| **Date Started:**<br>12/22/21 | **Date Finished:**<br>12/22/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** Unnamed Drainage | | | **PLS TRS-QQ:** 18N 44E 17 - AA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILT with sand (ML), loose to very loose, moist, tan, fine grained, [A-4]. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 75 | | 3 - 2 - 2 | | | | 10 | | | | | | |
| 5<br>2522.7 | | | 100 | | 3 - 2 - 3 | | | | 13 | | | | | | |
| | | | 100 | | 2 - 3 - 2 | | | | 13 | | NP | 80 | | | |
| 10<br>2517.7 | | | 100 | | 2 - 1 - 2 | | | | 16 | | | | | | |
| | | | 100 | | 2 - 3 - 4 | | Sandy SILT (ML), loose to very loose, multi-colored, [A-4]. Trace gravel. | 12.0<br>2515.7 | 13 | | | | | | |
| 15<br>2512.7 | | | 75 | | 3 - 2 - 2 | | | | 17 | | NP | 59 | | | |
| | | | | | | | Sandy SILTSTONE, tan to gray, very soft field hardness. Poorly lithified. Classifies as ML / A-4 when mechanically processed. | 16.8<br>2510.9 | | | | | | | |
| 20<br>2507.7 | | | 100 | | 2 - 3 - 3 | | | | 15 | | | | | | |
| 25<br>2502.7 | | | 100 | | 5 - 10 - 11 | | | | 24 | | NP | 66 | | | |
| 30<br>2497.7 | | | | | | | | | | | | | | | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

| Water Level Observations | | Remarks: Boring cave-in depth not measured. |
|---|---|---|
| ▽ End of Drilling: Not Encountered, Augers In | ▽ During Drilling: Not Encountered<br>▼ After Drilling: Not Encountered, Augers Out | |

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-16**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139141.5 ft<br>**Coordinates** E: 2803882.9 ft | **Station:** 1979 + 96<br>**Offset:** 5 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2527.7 ft |
| **Date Started:**<br>12/22/21 | **Date Finished:**<br>12/22/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** Unnamed Drainage | | | **PLS TRS-QQ:** 18N 44E 17 - AA<br>**Abandonment:** Cuttings |

| Depth (ft) Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 11 - 23 - 25 | | | | 23 | | | | | | |
| | | | | | | | No recovery, presumed to be sandstone. | 34.0<br>2493.7 | | | | | | | |
| 35<br>2492.7 | | | 0 | | 50/0.0ft | | | 35.0<br>2492.7 | | | | | | | |

Boring Depth: 35.0 ft, *Elevation: 2492.7 ft*

| *Water Level Observations* | | |
|---|---|---|
| End of Drilling: **Not Encountered, Augers In** | During Drilling: **Not Encountered** | Remarks: Boring cave-in depth not measured. |
| | After Drilling: **Not Encountered, Augers Out** | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-17**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139282.2 ft<br>**Coordinates** E: 2807191.8 ft | **Station:** 2013 + 08<br>**Offset:** 1 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2641.4 ft |
| **Date Started:**<br>10/21/21 | **Date Finished:**<br>10/21/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 16 - AB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Sandy Lean CLAY (CL), medium stiff, tan to brown, [A-4]. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 75 | | 3 - 3 - 2 | | | | 12 | 26 | 18 | 64 | | | |
| 5<br>2636.4 | | | 100 | | 2 - 2 - 1 | | Lean CLAY with sand (CL), very soft to medium stiff, tan to brown, [A-4]. | 5.4<br>2636.0 | 13 | | | | | | |
| | | | 75 | | 1 - 2 - 2 | | | | 13 | 24 | 16 | 79 | | | |
| 10<br>2631.4 | | | 100 | | | | | | 13 | 23 | 15 | 74 | | | |
| | | | 75 | | 2 - 3 - 2 | | | | 14 | | | | | | |
| 15<br>2626.4 | | | 75 | | 2 - 2 - 3 | | | | 16 | | | | | | |
| | | | | | | | Trace gravel at 18.0'. | | | | | | | | |
| 20<br>2621.4 | | | 50 | | 2 - 3 - 5 | | | | 18 | | | | | | |
| | | | | | | | Lean CLAY (CL), tan to brown, [A-6]. Trace gravel. Frequent iron oxide staining. | 23.5<br>2617.9 | | | | | | | |
| 25<br>2616.4 | | | 100 | | 1 - 2 - 3 | | 1" coal seam at 26.0'. | | 20 | | | | | | |
| 30<br>2611.4 | | | | | | | | | | | | | | | |

**Water Level Observations**

| | |
|---|---|
| ▽ During Drilling: Not Encountered | Remarks: Boring caved to 28.3' after augers removed. |
| ▼ End of Drilling: Not Encountered | ▼ After Drilling: Not Encountered |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-17**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139282.2 ft<br>**Coordinates** E: 2807191.8 ft | **Station:** 2013 + 08<br>**Offset:** 1 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2641.4 ft |
| **Date Started:**<br>10/21/21 | **Date Finished:**<br>10/21/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 16 - AB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 5 - 10 - 15 | | SILTSTONE, gray, very soft field hardness. Interbedded with claystone. Frequent evaporites and iron oxide staining. | 30.0<br>*2611.4* | 19 | | | | | | |
| 35<br>*2606.4* | | | 100 | | 10 - 17 - 25 | | | | 19 | | | | | | |
| 40<br>*2601.4* | | | 100 | | 5 - 9 - 19 | | 1" coal seam at 40.8'. | | 20 | | | | | | |
| | | | | | | | Boring Depth: 41.5 ft, *Elevation: 2599.9 ft* | 41.5<br>*2599.9* | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 28.3' after augers removed. |
|---|---|---|
| End of Drilling: Not Encountered | During Drilling: Not Encountered<br>After Drilling: Not Encountered | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-18**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139299.8 ft<br>**Coordinates** E: 2808068.6 ft | **Station:** 2021 + 85<br>**Offset:** 17 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2686.9 ft |
| **Date Started:**<br>10/21/21 | **Date Finished:**<br>10/21/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Kettner | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 16 - AA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Sandy SILT (ML), medium dense, dry to moist, gray, [A-4]. Increased sand content with depth. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 100 | | 5 - 7 - 8 | | | | 6 | | | | | | |
| 5<br>2681.9 | | | 100 | | 6 - 9 - 8 | | | | 7 | | | | | | |
| | | | 100 | | 7 - 12 - 18 | | | | 7 | | | | | | |
| 10<br>2676.9 | | | 100 | | 7 - 10 - 11 | | SILTSTONE, tan to gray, very soft field hardness. Frequent iron oxide staining. | 10.0<br>2676.9 | 22 | | | | | | |
| | | | 100 | | 11 - 21 - 30 | | CLAYSTONE, gray, very soft field hardness. Frequent iron oxide staining, coal fragments, evaporites. | 10.8<br>2676.1<br>12.8<br>2674.1 | 18 | | | | | | |
| 15<br>2671.9 | | | 100 | | 11 - 18 - 16 | | SILTSTONE, tan to gray, very soft field hardness. Frequent iron oxide staining. Occasional coal fragments and evaporites. Poorly lithified at 18'. | | 20 | | | | | | |
| 20<br>2666.9 | | | 100 | | 12 - 38 - 50/0.4ft | | | | 12 | | | | | | |
| 25<br>2661.9 | | | 100 | | 20 - 36 - 36 | | Silty SANDSTONE, gray to tan, fine grained, very soft field hardness. Frequent iron oxide staining. Poorly cemented. Classifies as SM [A-4] when mechanically processed. | 25.0<br>2661.9<br>26.1<br>2660.8 | 20 | | NP | 35 | | | |
| | | | | | | | SILTSTONE, tan to gray, very soft field hardness. Frequent iron oxide staining. | 28.0<br>2658.9 | | | | | | | |
| 30<br>2656.9 | | | 100 | | 20 - 22 - 50/0.4ft | | Sandy SILTSTONE, gray to tan, very soft field hardness. Poorly lithified. | | 16 | | | | | | |
| | | | | | | | Boring Depth: 31.4 ft, *Elevation: 2655.5 ft* | 31.4<br>2655.5 | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 16.8' after augers removed. |
|---|---|---|
| ▽ End of Drilling: | ▽ During Drilling: Not Encountered<br>▼ After Drilling: | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-19**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139381.4 ft<br>**Coordinates** E: 2809489.9 ft | **Station:** 2036 + 08<br>**Offset:** 7 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2600.2 ft |
| **Date Started:**<br>10/28/21 | **Date Finished:**<br>10/28/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 15 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 5 - 8 - 6 | | SILT with sand (ML), medium dense to loose, dry to moist, light brown, [A-4]. Trace clay. Occasional iron oxide stained mudstone fragments. | | 6 | | | | | | Hollow stem augers with finger bit. |
| 5<br>2595.2 | | | 95 | | 2 - 3 - 3 | | | | 8 | | NP | 75 | | | |
| | | | 95 | | 2 - 3 - 3 | | | | 13 | | | | | | VSTA: 4084 psf<br>VSTRESID: 1195 psf |
| | | | | | | | Lean CLAY with sand (CL), medium stiff, moist, light brown to gray, [A-6]. Frequent fine to coarse grained gravel sized mudstone fragments and black coal fragments. | 7.2<br>2593.0 | 16 | | | | | | |
| 10<br>2590.2 | | | 100 | | 3 - 9 - 17 | | Shaley CLAYSTONE, light brown to gray, soft to very soft field hardness. Frequent iron oxide stained fracture faces and thin dark brown to black coal seams. | 9.0<br>2591.2 | 19 | | | | | | |
| | | | 100 | | 7 - 15 - 23 | | | | 19 | | | | | | |
| | | | | | | | Boring Depth: 14.0 ft, *Elevation: 2586.2 ft* | 14.0<br>2586.2 | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 8.6' after augers removed. |
|---|---|---|
| End of Drilling: Not Encountered | During Drilling: Not Encountered<br>After Drilling: Not Encountered | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-20**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139420.2 ft<br>**Coordinates** E: 2810496.1 ft | **Station:** 2046 + 15<br>**Offset:** 5 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2584.2 ft |
| **Date Started:**<br>10/28/21 | **Date Finished:**<br>10/28/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Jaynes | **Notes:** Unnamed Drainage | | | **PLS TRS-QQ:** 18N 44E 15 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILT with sand (ML), loose to very loose, dry to moist, light brown to tan, [A-4]. Trace fine roots. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 97 | | 5 - 4 - 5 | | | | 5 | | | | | | |
| 5<br>2579.2 | | | 93 | | 3 - 3 - 5 | | Occasional dark brown to black coal fragments and fine to coarse grained gravel sized iron oxide stained mudstone fragments at 5'. | | 7 | | | | | | |
| | | | 92 | | 4 - 2 - 3 | | | | 6 | | | | | | |
| 10<br>2574.2 | | | 100 | | 3 - 3 - 2 | | | | 11 | | | | | | |
| | | | 100 | | 2 - 2 - 2 | | | | 15 | | | | | | |
| 15<br>2569.2 | | | 98 | | 1 - 2 - 3 | | Dark brown a 15'. | 15.2<br>2569.0 | 16<br>11 | | | | | | |
| | | | | | | | Lean CLAY with sand (CL), medium stiff, moist, brown, [A-6]. Increased sand with depth. Light brown to gray with frequent black coal fragments and mudstone fragments at 16'. | 16.5<br>2567.7 | 18 | | | | | | |
| 20<br>2564.2 | | | 100 | | 5 - 12 - 21 | | SILTSTONE, light brown to gray, very soft field hardness. Poorly lithified. Occasional iron oxide staining. Trace dark brown to black coal fragments. | | 16 | | | | | | |
| 25<br>2559.2 | | | 100 | | 11 - 28 - 37 | | | | 22 | | | | | | |
| | | | | | | | Boring Depth: 26.5 ft, *Elevation: 2557.7 ft* | 26.5<br>2557.7 | | | | | | | |

| Water Level Observations | | |
|---|---|---|
| ▽ End of Drilling: Not Encountered, Augers In | ▽ During Drilling: Not Encountered<br>▼ After Drilling: Not Encountered, Augers Out | Remarks: Boring caved to 19.5' after augers removed. |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-21**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139423.9 ft<br>**Coordinates** E: 2811414.1 ft | **Station:** 2055 + 32<br>**Offset:** 29 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2648.5 ft |
| **Date Started:**<br>12/15/21 | **Date Finished:**<br>12/15/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 15 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILT with sand (ML), loose, dry, light brown to tan, [A-4]. Trace fine grained iron oxide stained gravel clasts. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 93 | | 3 - 3 - 4 | | | | 3 | | | | | | |
| | | | | | | | | 3.5<br>2645.0 | 16 | | | | | | |
| 5<br>2643.5 | | | | | | | Lean CLAY (CL), medium stiff, moist, light brown to tan, [A-6]. Frequent white evaporite crystals. | | | | | | | | |
| | | | 83 | | 2 - 6 - 8 | | | 5.5<br>2643.0 | 22<br>19 | | | | | | |
| | | | | | | | Shaley CLAYSTONE, light brown to gray, soft to very soft field hardness. Occasional iron oxide staining with depth. Frequent thin black coal seams. | | | | | | | | |
| | | | 93 | | 5 - 4 - 7 | | | | 19 | | | | | | |
| 10<br>2638.5 | | | | | | | | | 13 | | | | | | |
| | | | 100 | | 10 - 19 - 29 | | | 11.0<br>2637.5 | 10 | | | | | | |
| | | | | | | | SILTSTONE, light brown to tan, very soft field hardness. Poorly lithified. Occasional white evaporites. | | | | | | | | |
| | | | | | | | | 12.7<br>2635.8 | 13 | | | | | | |
| | | | 100 | | 14 - 22 - 29 | | Shaley CLAYSTONE, gray, soft to very soft field hardness. Occasional iron oxide stained fracture faces and black coal speckling. | | 17 | | | | | | |
| 15<br>2633.5 | | | | | | | | | | | | | | | |
| | | | 100 | | 13 - 26 - 36 | | | | 16 | | | | | | |
| 20<br>2628.5 | | | | | | | | | | | | | | | |
| | | | 100 | | 10 - 17 - 25 | | Light brown to gray at 20'. | | 17 | | | | | | |
| | | | | | | | | 22.6<br>2625.9 | | | | | | | |
| | | | | | | | SANDSTONE, light gray, fine grained, very soft field hardness. Classifies as SM / A-2 when mechanically processed. | | | | | | | | |
| 25<br>2623.5 | | | | | | | | | | | | | | | |
| | | | 100 | | 26 - 43 - 50/0.4ft | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | |
| 2618.5 | | | | | | | | | | | | | | | |

| Water Level Observations | | Remarks: Boring cave-in depth not measured. |
|---|---|---|
| ▽ During Drilling: Not Encountered | | |
| ▼ End of Drilling: Not Encountered, Augers In | ▼ After Drilling: Not Encountered, Augers Out | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-21**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139423.9 ft<br>**Coordinates** E: 2811414.1 ft | **Station:** 2055 + 32<br>**Offset:** 29 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2648.5 ft |
| **Date Started:**<br>12/15/21 | **Date Finished:**<br>12/15/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 15 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 20 - 33 - 43 | | | | 3<br>2 | | NP | 25 | | | |
| 35<br>2613.5 | | | 100 | | 20 - 34 - 40 | | | | 3 | | | | | | |
| | | | | | | | Boring Depth: 36.5 ft, *Elevation: 2612.0 ft* | 36.5<br>2612.0 | | | | | | | |

| Water Level Observations | | Remarks: Boring cave-in depth not measured. |
|---|---|---|
| ▽ During Drilling: Not Encountered | ▼ End of Drilling: Not Encountered, Augers In | |
| ▽ After Drilling: Not Encountered, Augers Out | | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-22**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139488.7 ft<br>**Coordinates** E: 2813050.3 ft | **Station:** 2071 + 70<br>**Offset:** 31 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2641.9 ft |
| **Date Started:**<br>12/14/21 | **Date Finished:**<br>12/15/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 15 - AB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Sandy SILT (ML), medium dense, moist, light brown to tan, [A-4]. Decreasing sand content with depth. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 100 | | 4 - 5 - 7 | | | | 7 | | | | | | |
| 5<br>2636.9 | | | 82 | | 5 - 7 - 8 | | Shaley CLAYSTONE, light brown to gray, soft to very soft field hardness. Frequent iron oxide stained fracture faces. Trace black coal speckling. | 5.2<br>2636.7 | 22 | | | | | | |
| | | | 100 | | 8 - 7 - 5 | | SANDSTONE, light gray, fine grained, very soft field hardness. Black coal seam 8.7'-8.8' | 7.5<br>2634.4<br>8.8<br>2633.1 | 5<br>38<br>20 | | | | | | |
| 10<br>2631.9 | | | 100 | | 5 - 13 - 17 | | Shaley CLAYSTONE, gray, soft to very soft field hardness. Frequent thin black coal seams and iron oxide stained fracture faces. Classifies as CL / A-6 when mechanically processed. | | 19 | | | | | | |
| | | | 100 | | 5 - 13 - 19 | | | | 17 | 39 | 25 | 87 | | | |
| 15<br>2626.9 | | | 100 | | 5 - 10 - 14 | | Grayish brown with occasional thin black coal seams and iron oxide stained fracture faces at 15.4' | | 24 | | | | | | |
| 20<br>2621.9 | | | 100 | | 13 - 18 - 32 | | Blue-gray at 20'. | | 19 | | | | | | |
| 25<br>2616.9 | | | 100 | | 19 - 26 - 40 | | SANDSTONE, light gray to brown, fine grained, very soft field hardness. Occasional iron oxide staining. | 25.0<br>2616.9 | 6 | | | | | | |
| 30 | | | | | | | | | | | | | | | |
| 2611.9 | | | | | | | | | | | | | | | |

***Water Level Observations***

- ▽ During Drilling: **Not Encountered**
- ▼ End of Drilling: **Not Encountered**
- ▼ After Drilling: **Not Encountered**

Remarks: Boring cave-in depth not measured.

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-22**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139488.7 ft<br>**Coordinates** E: 2813050.3 ft | **Station:** 2071 + 70<br>**Offset:** 31 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2641.9 ft |
| **Date Started:**<br>12/14/21 | **Date Finished:**<br>12/15/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 15 - AB<br>**Abandonment:** Cuttings |

| Depth (ft) Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 23 - 34 - 46 | | | | 6 | | | | | | |
| 35<br>2606.9 | | | 100 | | 17 - 32 - 39 | | | | 13<br>17 | | | | | | |
| | | | | | | | SILTSTONE, light brown to gray, very soft field hardness. Poorly lithified. | 36.0<br>2605.9 | | | | | | | |
| | | | | | | | Boring Depth: 36.5 ft, *Elevation: 2605.4 ft* | 36.5<br>2605.4 | | | | | | | |

| Water Level Observations | | Remarks: Boring cave-in depth not measured. |
|---|---|---|
| ▽ During Drilling: Not Encountered | ▼ End of Drilling: Not Encountered | |
| ▽ After Drilling: Not Encountered | | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-23**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139570.6 ft<br>**Coordinates** E: 2814057.7 ft | **Station:** 2081 + 80<br>**Offset:** 10 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2599.6 ft |
| **Date Started:**<br>10/27/21 | **Date Finished:**<br>10/27/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 15 - AA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 83 | | WH - 3 - 5 | | TOPSOIL, SILT with sand (ML), moist, brown, [A-4]. Frequent organics and roots. | 0.2<br>2599.4 | 25<br>8 | | | | | | Hollow stem augers with finger bit. |
| | | | 100 | | | | SILT with sand (ML), loose, dry, light brown to tan, [A-4]. Trace thin roots. Decreasing sand content with depth. | | 16 | | NP | 80 | | | |
| 5<br>2594.6 | | | 97 | | 3 - 2 - 2 | | SILT (ML), very loose, dry to moist, light brown, [A-4]. | 5.0<br>2594.6 | 11 | | | | | | VSTA: 4174 psf |
| | | | 94 | | 2 - 2 - 2 | | | | 13 | | | | | | |
| 10<br>2589.6 | | | 95 | | 1 - 2 - 1 | | Sandy SILT (ML), very loose to loose, moist, light brown, [A-4]. | 9.0<br>2590.6 | 11 | | NP | 69 | | | VSTA: 2961 psf<br>VSTRESID: 1249 psf |
| | | | 100 | | 2 - 2 - 2 | | Trace fine to coarse grained, subrounded sand 10.7'-15'. | | 11 | | | | | | |
| 15<br>2584.6 | | | 95 | | 1 - 2 - 1 | | | | 14 | | | | | | |
| 20<br>2579.6 | | | 100 | | 2 - 2 - 2 | | | | 12 | | | | | | |
| 25<br>2574.6 | | | 100 | | 4 - 5 - 4 | | Light brown to gray at 25'. | | 10 | | | | | | |
| 30<br>2569.6 | | | 100 | | 13 - 27 - 33 | | SILTSTONE, light brown to gray, very soft field hardness. Poorly lithified. Trace fine grained sand. Increased sand content and occasional iron oxide staining at 31'. | 28.0<br>2571.6 | 15 | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 26' after augers removed. |
|---|---|---|
| ▽ During Drilling: Not Encountered | ▼ End of Drilling: Not Encountered | |
| ▼ After Drilling: Not Encountered | | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-23**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139570.6 ft<br>**Coordinates** E: 2814057.7 ft | **Station:** 2081 + 80<br>**Offset:** 10 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2599.6 ft |
| **Date Started:**<br>10/27/21 | **Date Finished:**<br>10/27/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 15 - AA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35<br>2564.6 | | | 100 | | 10 - 28 - 50/0.4ft | | | | 12 | | | | | | |
| 40<br>2559.6 | | | 100 | | 11 - 27 - 48 | | | | 20 | | | | | | |
| | | | | | | | Boring Depth: 41.5 ft, *Elevation: 2558.1 ft* | 41.5<br>2558.1 | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 26' after augers removed. |
|---|---|---|
| ▽ During Drilling: Not Encountered | ▼ End of Drilling: Not Encountered | |
| ▽ After Drilling: Not Encountered | | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-24**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139594 ft<br>**Coordinates** E: 2814798.7 ft | **Station:** 2089 + 21<br>**Offset:** 3 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2619.2 ft |
| **Date Started:**<br>10/27/21 | **Date Finished:**<br>10/27/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 14 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILT (ML), loose to medium dense, light brown to tan, [A-4]. Frequent black coal speckling. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 100 | | 3 - 4 - 6 | | | | 16 | | | | | | |
| 5<br>2614.2 | | | 100 | | 4 - 7 - 17 | | White evaporite crysals and medium grained sand inclusions at 6'. | | 17 | | | | | | |
| | | | 100 | | 9 - 18 - 25 | | SILTSTONE, light brown to tan, very soft field hardness. Poorly lithified. | 8.0<br>2611.2 | 18 | | | | | | |
| 10<br>2609.2 | | | 100 | | 9 - 20 - 31 | | Iron oxide staining and black speckling at 11'. | | 17 | | | | | | |
| | | | 100 | | 10 - 20 - 25 | | Light brown to gray at 13'. | | 15 | | | | | | |
| 15<br>2604.2 | | | 100 | | 7 - 17 - 27 | | | | 17 | | | | | | |
| 20<br>2599.2 | | | 100 | | 13 - 24 - 32 | | | | 15 | | | | | | |
| | | | | | | | Boring Depth: 21.5 ft, *Elevation: 2597.7 ft* | 21.5<br>2597.7 | | | | | | | |

| Water Level Observations | | |
|---|---|---|
| End of Drilling: Not Encountered | During Drilling: Not Encountered | Remarks: Boring caved to 13.1' after augers removed. |
| | After Drilling: Not Encountered | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-25**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139641.6 ft<br>**Coordinates** E: 2816668.1 ft | **Station:** 2107 + 91<br>**Offset:** 25 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2548.4 ft |
| **Date Started:**<br>12/14/21 | **Date Finished:**<br>12/14/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Jaynes | **Notes:** Cemetery Coulee Tributary | | | **PLS TRS-QQ:** 18N 44E 14 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILT (ML), very loose, moist, brown, [A-4]. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 80 | | 2 - 2 - 2 | | | | 20 | | | | | | |
| | | | | | | | | 4.0<br>2544.4 | | | | | | | |
| 5<br>2543.4 | | | | | | | SILT with sand (ML), very loose, moist, brown, [A-4]. Frequent black coal speckling. | | 19 | | NP | 80 | | | |
| | | | | | | | | | | | | | | | VSTA: 1314 psf<br>VSTRESID: 513 psf |
| | | | 87 | | WH - WH - 3 | | Trace fine-grained sand at 7.5'. | | 22 | | | | | | |
| | | | | | | | Light brown to tan, lean clay layer 8.3'-9'. | | 23 | | | | | | |
| 10<br>2538.4 | | | | | | | | | 19 | | NP | 83 | | | |
| | | | | | | | Light brown to gray at 12.5'. | | | | | | | | VSTA: 3564 psf |
| | | | | | | | | 13.0<br>2535.4 | 20 | | | | | | |
| | | | 100 | | 3 - 4 - 6 | | SILTSTONE, light brown to gray, very soft field hardness. Poorly lithified. Frequent iron oxide staining. | | 20 | | | | | | |
| 15<br>2533.4 | | | | | | | | 14.6<br>2533.8 | | | | | | | |
| | | | 100 | | 9 - 19 - 28 | | Shaley CLAYSTONE, light brown to gray, very soft to soft field hardness. Frequent iron oxide stained fracture faces. | | 18 | | | | | | |
| | | | | | | | | 18.0<br>2530.4 | | | | | | | |
| 20<br>2528.4 | | | | | | | SILTSTONE, light brown to gray, very soft field hardness. Poorly lithified. Frequent iron oxide stained fracture faces. | | | | | | | | |
| | | | 100 | | 6 - 11 - 12 | | | | 24 | | | | | | |
| 25<br>2523.4 | | | | | | | | | | | | | | | |
| | | | 100 | | 10 - 17 - 27 | | | | 18 | | | | | | |
| | | | | | | | Boring Depth: 26.5 ft, *Elevation: 2521.9 ft* | 26.5<br>2521.9 | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 18' after augers removed. |
|---|---|---|
| End of Drilling: Not Encountered | During Drilling: Not Encountered<br>After Drilling: Not Encountered | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-26**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 55<br>**Hammer:** Auto | **Boring Location** N: 1139710.5 ft<br>**Coordinates** E: 2817668 ft | **Station:** 2117 + 93<br>**Offset:** 3 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2550.5 ft |
| **Date Started:**<br>2/2/22 | **Date Finished:**<br>2/2/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Boyd<br>**Logger:** Kettner | **Notes:** Unnamed Drainage | | | **PLS TRS-QQ:** 18N 44E 14 - AB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | TOPSOIL, SILT (ML), moist to dry, dark brown, [A-4]. Frequent roots. | 2.7<br>2547.8 | | | | | | | Hollow stem augers with finger bit. |
| | | | 75 | | 3 - 2 - 2 | | SILT (ML), very loose to loose, moist, tan to gray, [A-4]. Occasional roots 2.7'-3'. | | 15 | | | | | | |
| 5<br>2545.5 | | | 75 | | 1 - 2 - 4 | | | | 17 | | | | | | |
| | | | 100 | | | | | | 20 | | NP | 89 | | | |
| 10<br>2540.5 | | | 100 | | 2 - 4 - 4 | | | | 16 | | | | | | |
| | | | 100 | | 2 - 4 - 5 | | Frequent coal fragments and occasional evaporites 12.5'-14'. | | 22 | | | | | | |
| 15<br>2535.5 | | | 100 | | 2 - 2 - 2 | | | | 20 | | | | | | |
| | | | | | | | SILT with sand and gravel (ML), very loose, moist, gray to orange, fine to coarse grained, [A-4]. Frequent sand and gravel seams. Frequent iron oxide staining. | 18.0<br>2532.5 | | | | | | | |
| 20<br>2530.5 | | | 100 | | WH - WH - 3 | | | | | | | | | | |
| | | | | | | | SILT (ML), very loose to medium dense, moist, gray, [A-4]. | 21.3<br>2529.2 | | | | | | | |
| 25<br>2525.5 | | | 100 | | 2 - 4 - 7 | | | | | | NP | 95 | | | |
| | | | | | | | Boring Depth: 26.5 ft, *Elevation: 2524.0 ft* | 26.5<br>2524.0 | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 2.6' after augers removed. |
|---|---|---|
| During Drilling: Not Encountered | | |
| End of Drilling: Not Encountered | After Drilling: Not Encountered | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-27**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139722.6 ft<br>**Coordinates** E: 2817874.3 ft | **Station:** 2119 + 99<br>**Offset:** 7 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2548.8 ft |
| **Date Started:**<br>10/26/21 | **Date Finished:**<br>10/26/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Jaynes | **Notes:** Unnamed Drainage | | | **PLS TRS-QQ:** 18N 44E 14 - AB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILT (ML), loose, moist, light brown, [A-4]. Iron oxide stained siltstone/mudstone fragments at 6.3'. Increased clay content with depth. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 90 | | 3 - 4 - 4 | | | | 10 | | | | | | |
| 5<br>2543.8 | | | 95 | | 2 - 3 - 3 | | | | 13 | | NP | 87 | | | |
| | | | 77 | | 2 - 2 - 2 | | | | 16 | | | | | | |
| 10<br>2538.8 | | | 97 | | 3 - 6 - 9 | | SILTSTONE, light brown to gray, very soft field hardness. Frequent iron oxide staining and layering at 10.5'. | 9.4<br>2539.4 | 20 | | | | | | |
| | | | 100 | | 10 - 13 - 15 | | CLAYSTONE, light brown to rusty brown, very soft field hardness. Frequent iron oxide staining at 15'. | 11.6<br>2537.2 | 20 | | | | | | |
| 15<br>2533.8 | | | 100 | | 6 - 13 - 19 | | | | 19 | | | | | | |
| | | | | | | | SILTSTONE, light brown to gray, very soft field hardness. | 16.1<br>2532.7 | 21 | | | | | | |
| 20<br>2528.8 | | | 100 | | 4 - 6 - 11 | | Occasional iron oxide staining and dark brown to black coal fragments at 20'. | | 23 | | | | | | |
| | | | | | | | Boring Depth: 21.5 ft, *Elevation: 2527.3 ft* | 21.5<br>2527.3 | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 13.7' after augers removed. |
|---|---|---|
| End of Drilling: Not Encountered | During Drilling: Not Encountered<br>After Drilling: Not Encountered | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-28**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139735.7 ft<br>**Coordinates** E: 2818349.6 ft | **Station:** 2124 + 75<br>**Offset:** 0 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2535.9 ft |
| **Date Started:**<br>10/26/21 | **Date Finished:**<br>10/26/21 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Duncan<br>**Logger:** Jaynes | **Notes:** Cemetery Coulee | | | **PLS TRS-QQ:** 18N 44E 14 - AB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 87 | | 1 - 2 - 1 | | SILT with sand (ML), very loose, moist to wet, light brown, [A-4]. Trace thin roots. | | 22 | | | | | | Hollow stem augers with finger bit. |
| 5<br>2530.9 | | | 95 | | | | | | 18 | | NP | 82 | | | |
| | | | 100 | | WH - 3 - 2 | | | | 22 | | | | | | VSTA: 678 psf<br>VSTRESID: 143 psf |
| | | | | | | | Sandy SILT (ML), loose, wet, light brown, [A-4]. | 8.2<br>2527.7 | 22 | | | | | | |
| 10<br>2525.9 | | | 100 | | | | | | 26 | | NP | 62 | | | |
| | | | | | | | SILTSTONE, light brown, very soft field hardness. Frequent iron oxide staining. | 11.2<br>2524.7 | | | | | | | |
| | | | 100 | | 9 - 15 - 13 | | | | 25 | | | | | | |
| 15<br>2520.9 | | | 100 | | 8 - 14 - 24 | | CLAYSTONE, light gray, soft to very soft field hardness. Frequent dark brown to black coal fragments. Thin black coal seam 15.2'. Light brown siltstone layer 15.5'-16.5'. | 14.5<br>2521.4 | 21<br>22 | | | | | | |
| 20<br>2515.9 | | | 100 | | 7 - 16 - 25 | | | | 21 | | | | | | |
| | | | | | | | Boring Depth: 21.5 ft, *Elevation: 2514.4 ft* | 21.5<br>2514.4 | | | | | | | |

| Water Level Observations | |
|---|---|
| End of Drilling: 17.3 ft *(2518.6 ft), Augers In* | During Drilling: 7.3 ft *(2528.6 ft)*<br>After Drilling: Not Encountered, Augers Out |

Remarks: Boring caved to 8' after augers removed.

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-29**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 55<br>**Hammer:** Auto | **Boring Location** N: 1139487.4 ft<br>**Coordinates** E: 2812188.5 ft | **Station:** 2063 + 09<br>**Offset:** 3 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2618.5 ft |
| **Date Started:**<br>2/2/22 | **Date Finished:**<br>2/2/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Boyd<br>**Logger:** Kettner | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 15 - AB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILT (ML), loose to medium dense, moist, tan to gray, [A-4]. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 75 | | 3 - 4 - 5 | | | | 21 | | | | | | |
| 5<br>2613.5 | | | 100 | | 4 - 7 - 9 | | | | 15 | | NP | 94 | | | |
| | | | | | | | | 7.0<br>2611.5 | | | | | | | |
| | | | 100 | | 8 - 13 - 21 | | SILTSTONE, tan to gray, very soft field hardness. Poorly lithified. | | 11 | | | | | | |
| 10<br>2608.5 | | | 100 | | 8 - 17 - 22 | | | | 17 | | | | | | |
| | | | 100 | | 8 - 17 - 23 | | | | 20 | | | | | | |
| | | | | | | | | 14.5<br>2604.0 | | | | | | | |
| 15<br>2603.5 | | | 100 | | 8 - 18 - 41 | | Shaley CLAYSTONE, tan to gray, very soft field hardness. | | 16 | | | | | | |
| 20<br>2598.5 | | | 100 | | 11 - 24 - 39 | | | | 15 | | | | | | |
| | | | | | | | | 21.5<br>2597.0 | | | | | | | |

Boring Depth: 21.5 ft, *Elevation: 2597.0 ft*

| Water Level Observations | | Remarks: Boring caved to 9' after augers removed. |
|---|---|---|
| End of Drilling: Not Encountered | During Drilling: Not Encountered<br>After Drilling: Not Encountered | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-30**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138519.5 ft<br>**Coordinates** E: 2785875.5 ft | **Station:** 1799 + 77<br>**Offset:** 11 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2521.6 ft |
| **Date Started:**<br>2/15/22 | **Date Finished:**<br>2/15/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Helgerson<br>**Logger:** Kettner | **Notes:** | | | **PLS TRS-QQ:** 18N 43E 11 - CD<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Sandy SILT (ML), very loose, moist, tan to brown, [A-4]. | | | | | | | | Hollow stem augers with finger bit. |
| | | | 75 | | 2 - 1 - 2 | | Silty sand layer 2.8'-3.0'. | | 17 | | | | | | |
| 5<br>2516.6 | | | 100 | | 1 - 2 - 4 | | | | 8<br>22<br>23 | | | | | | |
| | | | | | | | Poorly-Graded SAND with silt and gravel (SP), loose, moist to wet, tan to brown, [A-2]. ▽ | 6.3<br>2515.3 | | | | | | | |
| | | | 75 | | 2 - 1 - 6 | | SILTSTONE, gray to tan, very soft field hardness. | 8.4<br>2513.2 | | | | | | | |
| 10<br>2511.6 | | | 100 | | 7 - 12 - 17 | | | | | | | | | | |
| | | | 100 | | 7 - 9 - 17 | | CLAYSTONE, gray, very soft field hardness. ▼ | 12.0<br>2509.6 | | | | | | | |
| 15<br>2506.6 | | | 50 | | 10 - 23 - 36 | | Sandy SILTSTONE, tan to gray, very soft field hardness. Poorly lithified. | 14.5<br>2507.1 | | | | | | | |
| | | | | | | | Boring Depth: 16.5 ft, *Elevation: 2505.1 ft* | 16.5<br>2505.1 | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 12.9' after augers removed. |
|---|---|---|
| ▽ During Drilling: **7.1 ft** *(2514.5 ft)* | | |
| ▼ End of Drilling: **14.5 ft** *(2507.1 ft), Augers In* | ▼ After Drilling: **10.4 ft** *(2511.2 ft), Augers Out* | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-31**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138577.8 ft<br>**Coordinates** E: 2787650.2 ft | **Station:** 1817 + 52<br>**Offset:** 3 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2512.4 ft |
| **Date Started:**<br>8/9/22 | **Date Finished:**<br>8/9/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Higdon<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 43E 11 - DD<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 93 | | 3 - 3 - 2 | | SILT with sand (ML), loose, moist, light brown to tan. | | 7 | | | | | | Hollow stem augers with finger bit. |
| | | | | | | | Sandy SILT (ML), light brown to tan, [A-4]. | 2.0<br>2510.4 | | | | | | | |
| | | | 100 | | | | | | 10 | | NP | 56 | | | |
| 5<br>2507.4 | | | | | | | | | | | | | | | VSTA: 815 psf<br>VSTRESID: 181 psf |
| | | | 87 | | WH - 1 - 2 | | Silty SAND (SM), very loose, light brown to tan, fine grained, [A-2]. | 6.0<br>2506.4 | 12 | | | | | | |
| | | | | | | | Silty SAND with gravel (SM), very loose, moist to wet, brown, fine to coarse grained, subangular to angular, [A-2]. Occasional thin (<1") silt seams. | 6.9<br>2505.5 | 17 | | | | | | |
| | | | 90 | | 1 - 1 - 3 | | | | 17 | | | | | | |
| 10<br>2502.4 | | | | | | | Clayey GRAVEL with sand (GC), loose, wet, brown, fine to coarse grained, subangular to angular, [A-2]. | 10.0<br>2502.4 | | | | | | | |
| | | | 87 | | 2 - 3 - 7 | | | 11.7<br>2500.7 | 21<br>20 | | | | | | |
| | | | 100 | | 5 - 10 - 18 | | SANDSTONE, light brown to tan, fine grained, very soft field hardness. Poorly cemented. | 13.5<br>2498.9 | 13 | | | | | | |
| 15<br>2497.4 | | | | | | | CLAYSTONE, brownish gray, very soft to soft field hardness. | 15.5<br>2496.9 | | | | | | | |
| | | | | | | | SILTSTONE, light gray, very soft field hardness. Poorly lithified. | | | | | | | | |
| 20<br>2492.4 | | | 100 | | 14 - 33 - 50/0.4ft | | Shaley CLAYSTONE, light brown to light gray, very soft to soft field hardness. | 20.8<br>2491.6 | 19<br>14 | | | | | | |
| | | | | | | | Boring Depth: 21.4 ft, *Elevation: 2491.0 ft* | 21.4<br>2491.0 | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 12' after augers removed. |
|---|---|---|
| End of Drilling: Not Encountered, Augers In | During Drilling: 9.1 ft *(2503.3 ft)*<br>After Drilling: 11.0 ft *(2501.4 ft) +0.25 hrs. Augers Out* | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-32**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138832.5 ft<br>**Coordinates** E: 2795571.4 ft | **Station:** 1896 + 79<br>**Offset:** 24 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2491.2 ft |
| **Date Started:**<br>8/17/22 | **Date Finished:**<br>8/17/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Higdon<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 18 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 90 | | 3 - 3 - 5 | | TOPSOIL, Lean CLAY with sand (CL), medium stiff, dry, light brown to tan, [A-4]. Thin roots. Trace fine-grained gravel sized clinker. | 0.5<br>*2490.7* | 7 | | | | | | Hollow stem augers with finger bit. |
| | | | 90 | | 2 - 2 - 4 | | Lean CLAY with sand (CL), medium stiff, dry, light brown to tan, [A-4]. | 3.5<br>*2487.7* | 12<br>9 | | | | | | |
| 5<br>*2486.2* | | | 100 | | 4 - 7 - 7 | | SANDSTONE, light brown to tan, fine grained, very soft field hardness. Very poorly cemented. Occasional iron oxide staining. Classifies as ML / A-4 when mechanically processed. | 6.5<br>*2484.7* | 9 | | NP | 87 | | | |
| | | | 93 | | 5 - 7 - 9 | | Shaley CLAYSTONE, grayish brown, soft to very soft field hardness. Frequent iron oxide stained fracture faces and white evaporites. | 8.6<br>*2482.6* | 15<br>50 | | | | | | |
| 10<br>*2481.2* | | | 87 | | 2 - 4 - 8 | | COAL, black. Occasional white evaporites. CLAYSTONE, brownish gray, soft to very soft field hardness. Frequent black to dark brown coal fragments. Occasional evaporite crystals and iron oxide staining. | 10.6<br>*2480.6*<br>12.0<br>*2479.2* | 60<br>17<br>14 | | | | | | |
| | | | 100 | | 10 - 14 - 32 | | SILTSTONE, brownish gray, very soft field hardness. Poorly lithified. Occasional dark brown to black coal fragments and iron oxide staining. | 13.4<br>*2477.8* | 14 | | | | | | |
| 15<br>*2476.2* | | | 100 | | 14 - 21 - 27 | | SANDSTONE, brownish gray, fine grained, very soft field hardness. Very poorly cemented. Frequent iron oxide staining. SILTSTONE, grayish brown, very soft field hardness. Very poorly lithified. Frequent iron oxide staining. | 15.3<br>*2475.9* | 14<br>18 | | | | | | |
| 20<br>*2471.2* | | | 100 | | 11 - 28 - 43 | | | | 15 | | | | | | |
| 25<br>*2466.2* | | | 100 | | 11 - 21 - 41 | | Shaley CLAYSTONE, brownish gray, soft to very soft field hardness. Occasional iron oxide stained fracture faces. | 25.5<br>*2465.7* | 16<br>18 | | | | | | |
| 30 | | | | | | | | | | | | | | | |
| *2461.2* | | | | | | | | | | | | | | | |

***Water Level Observations***

- ▽ During Drilling: **Not Encountered**
- ▼ End of Drilling: **Not Encountered, Augers In**
- ▼ After Drilling: **Not Encountered +0.25 hrs, Augers Out**

Remarks: Boring caved to 25.6' after augers removed.

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-32**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138832.5 ft<br>**Coordinates** E: 2795571.4 ft | **Station:** 1896 + 79<br>**Offset:** 24 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2491.2 ft |
| **Date Started:**<br>8/17/22 | **Date Finished:**<br>8/17/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Higdon<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 18 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 10 - 25 - 47 | | Gray at 30'. | | | | | | | | |
| | | | | | | | SILTSTONE, gray, very soft field hardness. Very poorly lithified. | 31.3<br>2459.9 | | | | | | | |
| 35<br>2456.2 | | | 100 | | 15 - 50/0.3ft | | COAL, black to dark brown. Occasional sulfide mineralization. | 35.3<br>2455.9 | 17<br>30 | | | | | | |
| | | | | | | | SILTSTONE, light gray, very soft field hardness. Poorly lithified. | 37.0<br>2454.2 | | | | | | | |
| 40<br>2451.2 | | | | | | | | | | | | | | | |
| | | | | | | | COAL, black. | 41.0<br>2450.2 | | | | | | | |
| | | | | | | | SILTSTONE, light gray, very soft field hardness. Poorly lithified. | 43.5<br>2447.7 | | | | | | | |
| 45<br>2446.2 | | | 100 | | 14 - 29 - 46 | | Dark gray and increased lithification with depth. | | 14 | | | | | | |
| | | | | | | | Boring Depth: 46.5 ft, *Elevation: 2444.7 ft* | 46.5<br>2444.7 | | | | | | | |

| Water Level Observations | | |
|---|---|---|
| ▽ End of Drilling: Not Encountered, Augers In | ▽ During Drilling: Not Encountered<br>▼ After Drilling: Not Encountered +0.25 hrs, Augers Out | Remarks: Boring caved to 25.6' after augers removed. |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-33**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138928.3 ft<br>**Coordinates** E: 2798188.1 ft | **Station:** 1922 + 97<br>**Offset:** 14 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2470.4 ft |
| **Date Started:**<br>7/27/22 | **Date Finished:**<br>7/27/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Higdon<br>**Logger:** Hilchen | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 18 - AA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 85 | | 2 - 2 - 3 | | SILT (ML), loose to very loose, moist, brown, [A-4]. Frequent lean clay layers. | | 21 | | | | | | Hollow stem augers with finger bit. |
| | | | 35 | | | | | | 19 | | | | | | |
| 5<br>2465.4 | | | 100 | | WH - WH - 2 | | | | 20 | | | | | | |
| | | | 85 | | | | | | 23 | 32 | 19 | 99 | | | |
| 10<br>2460.4 | | | 100 | | WH - WH - WH | | | | 26 | | | | | | |
| | | | 80 | | | | | | | | | | | | |
| 15<br>2455.4 | | | 95 | | WH - WH - WH | | | | 24 | | | | | | |
| | | | | | | | | 19.3<br>2451.1 | | | | | | | |
| 20<br>2450.4 | | | 100 | | 6 - 9 - 10 | | SILTSTONE, gray to brown, very soft field hardness. Poorly lithified. | | 13 | | | | | | |
| 25<br>2445.4 | | | 100 | | 6 - 10 - 11 | | | | 23 | | | | | | |
| | | | | | | | Boring Depth: 26.5 ft, *Elevation: 2443.9 ft* | 26.5<br>2443.9 | | | | | | | |

| Water Level Observations | | |
|---|---|---|
| End of Drilling: Not Encountered, Augers In | During Drilling: Not Encountered | Remarks: Boring cave-in depth not measured. |
| | After Drilling: 21.7 ft *(2448.7 ft) +0.2 hrs, Augers Out* | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-34**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139014.1 ft<br>**Coordinates** E: 2800205.6 ft | **Station:** 1943 + 17<br>**Offset:** 17 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2495.8 ft |
| **Date Started:**<br>7/27/22 | **Date Finished:**<br>7/27/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Higdon<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 17 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 50 | | 1 - 2 - 4 | | TOPSOIL, Sandy SILT (ML), loose, dry, light brown to tan, [A-4]. Thin roots. | 0.3<br>2495.5 | 8 | | NP | 59 | | | Hollow stem augers with finger bit. |
| | | | | | | | Sandy SILT (ML), loose, dry, light brown to tan, [A-4]. | 0.8<br>2495.0 | | | | | | | |
| | | | 75 | | 1 - 2 - 3 | | SILTSTONE, grayish brown, very soft field hardness. Poorly lithified. Frequent iron oxide staining. Trace black coal fragments. | | 20 | | | | | | |
| 5<br>2490.8 | | | 50 | | 1 - 2 - 3 | | SANDSTONE, brownish gray, fine grained, very soft field hardness. Classifies as SM / A-2 when mechanically processed. | 4.5<br>2491.3 | 10 | | NP | 29 | | | |
| | | | 80 | | 2 - 4 - 6 | | CLAYSTONE, brownish gray, very soft field hardness. Frequent iron oxide staining. | 7.0<br>2488.8 | 18 | | | | | | |
| 10<br>2485.8 | | | 100 | | 4 - 8 - 20 | | Shaley CLAYSTONE, brownish gray, soft to very soft field hardness. Frequent iron oxide stained fracture faces. Occasional evaporite crystals. | 9.5<br>2486.3 | 18 | | | | | | |
| | | | 100 | | 7 - 11 - 15 | | | | 15 | | | | | | |
| 15<br>2480.8 | | | 100 | | 7 - 9 - 7 | | | | 22 | | | | | | |
| | | | | | | | COAL, black. | 16.0<br>2479.8 | 41 | | | | | | |
| | | | | | | | CLAYSTONE, brownish gray, very soft field hardness. Frequent iron oxide staining. | 17.0<br>2478.8 | | | | | | | |
| 20<br>2475.8 | | | 100 | | 6 - 13 - 30 | | | | 16 | | | | | | |
| | | | | | | | SILTSTONE, grayish brown, very soft field hardness. Poorly lithified. Frequent iron oxide staining. | 23.5<br>2472.3 | | | | | | | |
| 25<br>2470.8 | | | 100 | | 8 - 27 - 36 | | | | 17 | | | | | | |
| 30 | | | | | | | | | | | | | | | |
| 2465.8 | | | | | | | | | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 26.0' after augers removed. |
|---|---|---|
| ▽ During Drilling: Not Encountered | | |
| ▼ End of Drilling: Not Encountered, Augers In | ▼ After Drilling: Not Encountered +0.25 hrs, Augers Out | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-34**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139014.1 ft<br>**Coordinates** E: 2800205.6 ft | **Station:** 1943 + 17<br>**Offset:** 17 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2495.8 ft |
| **Date Started:**<br>7/27/22 | **Date Finished:**<br>7/27/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Higdon<br>**Logger:** Jaynes | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 17 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 9 - 22 - 30 | | | | 15 | | | | | | |
| 35<br>2460.8 | | | 100 | | 10 - 20 - 31 | | CLAYSTONE, brownish gray, soft to very soft field hardness. Frequent iron oxide staining. | 34.0<br>2461.8<br>35.3<br>2460.5 | 16<br>16 | | | | | | |
| | | | | | | | Shaley CLAYSTONE, gray, soft to very soft field hardness. Occasional iron oxide stained fracture faces. | 36.5<br>2459.3 | | | | | | | |

Boring Depth: 36.5 ft, *Elevation: 2459.3 ft*

| Water Level Observations | | |
|---|---|---|
| End of Drilling: Not Encountered, Augers In | During Drilling: Not Encountered<br>After Drilling: Not Encountered +0.25 hrs, Augers Out | Remarks: Boring caved to 26.0' after augers removed. |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-35**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139162.1 ft<br>**Coordinates** E: 2804065.6 ft | **Station:** 1981 + 79<br>**Offset:** 8 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2539.9 ft |
| **Date Started:**<br>8/10/22 | **Date Finished:**<br>8/10/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Higdon<br>**Logger:** Haag | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 16 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 3 - 4 - 5 | | SILT with sand (ML), loose, moist, light brown to tan, [A-4]. Frequent roots 0-1.5'. | | 3 | | | | | | Hollow stem augers with finger bit. |
| | | | 100 | | | | | | 12 | | NP | 76 | | | |
| 5<br>2534.9 | | | 90 | | 4 - 4 - 4 | | SILT (ML), loose, moist, light brown to tan, [A-4]. | 4.5<br>2535.4 | 5 | | | | | | |
| | | | 93 | | 3 - 2 - 4 | | | | 10 | | | | | | |
| 10<br>2529.9 | | | 100 | | | | Lean CLAY with sand (CL), moist, gray to dark gray, [A-6]. | 9.5<br>2530.4 | 14 | 30 | 13 | 84 | | | |
| | | | 100 | | 1 - 2 - 3 | | Lean CLAY (CL), medium stiff, moist, dark gray, [A-6]. | 12.5<br>2527.4 | 16 | 29 | 13 | 91 | | | |
| 15<br>2524.9 | | | 93 | | 1 - 2 - 3 | | | | 16 | | | | | | |
| | | | | | | | SILTSTONE, tan to gray, very soft field hardness. Poorly lithified. | 17.5<br>2522.4 | | | | | | | |
| 20<br>2519.9 | | | 97 | | 3 - 8 - 10 | | | | 19 | | | | | | |
| | | | | | | | Sandy SILTSTONE, tan to gray, very soft field hardness. Poorly lithified. | 22.5<br>2517.4 | | | | | | | |
| 25<br>2514.9 | | | 100 | | 10 - 17 - 18 | | | | 16 | | | | | | |
| | | | | | | | SANDSTONE, light gray to tan, fine grained, very soft field hardness. Poorly cemented. Frequent iron oxide staining. | 27.0<br>2512.9 | | | | | | | |
| 30<br>2509.9 | | | 100 | | 9 - 30 - 38 | | | | 16 | | | | | | |
| | | | | | | | Boring Depth: 31.5 ft, *Elevation: 2508.4 ft* | 31.5<br>2508.4 | | | | | | | |

| Water Level Observations | | Remarks: Boring caved to 24.5' after augers removed. |
|---|---|---|
| End of Drilling: Not Encountered, Augers In | After Drilling: Not Encountered, Augers Out | |

During Drilling: Not Encountered

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-36**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139316.4 ft<br>**Coordinates** E: 2808442.9 ft | **Station:** 2025 + 59<br>**Offset:** 16 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2678.3 ft |
| **Date Started:**<br>8/24/22 | **Date Finished:**<br>8/24/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Higdon<br>**Logger:** Kettner | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 16 - AA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5<br>2673.3 | | | 100 | | 5 - 6 - 8 | | Sandy SILT (ML), medium dense, dry to moist, gray, [A-4]. Topsoil 0-0.4'. | | 16 | | | | | | Hollow stem augers with finger bit. |
| | | | | | | | | 8.0<br>2670.3 | | | | | | | |
| 10<br>2668.3 | | | 100 | | 6 - 11 - 18 | | Sandy SILTSTONE, gray, very soft to soft field hardness. Occasional iron oxide staining. Poorly lithified. Interbedded with poorly cemented silty sandstone. | | 8 | | | | | | |
| 15<br>2663.3 | | | 100 | | 9 - 21 - 40 | | Occasional evaporites at 15.0'. | | 15 | | | | | | |
| 20<br>2658.3 | | | 100 | | 10 - 25 - 36 | | Frequent iron oxide staining and less sand content at 20.0'. | | 21 | | | | | | |
| 25<br>2653.3 | | | 100 | | 10 - 15 - 14 | | | | 16 | | | | | | |
| | | | | | | | Shaley CLAYSTONE, gray, very soft to soft field hardness. | 26.1<br>2652.2 | 20 | | | | | | |
| | | | | | | | Sandy SILTSTONE, gray, very soft to soft field hardness. Occasional evaporites. Frequent iron oxide staining. | 27.5<br>2650.8 | | | | | | | |
| 30<br>2648.3 | | | | | | | | | | | | | | | |

**Water Level Observations**

- ▽ During Drilling: **Not Encountered**
- ▼ End of Drilling: **Not Encountered, Augers In**
- ▼ After Drilling: **Not Encountered, Augers Out**

Remarks: Cave in at 18.5'

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-36**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139316.4 ft<br>**Coordinates** E: 2808442.9 ft | **Station:** 2025 + 59<br>**Offset:** 16 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2678.3 ft |
| **Date Started:**<br>8/24/22 | **Date Finished:**<br>8/24/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Higdon<br>**Logger:** Kettner | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 16 - AA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 11 - 17 - 30 | | | | 19 | | | | | | |
| 35<br>2643.3 | | | 100 | | 9 - 13 - 20 | | Occasional claystone seams/layers and coal fragments at 35.0'. | | 18 | | | | | | |
| 40<br>2638.3 | | | 100 | | 10 - 24 - 35 | | | | 13 | | | | | | |
| | | | | | | | Boring Depth: 41.5 ft, *Elevation: 2636.8 ft* | 41.5<br>2636.8 | | | | | | | |

| Water Level Observations | | |
|---|---|---|
| End of Drilling: Not Encountered, Augers In | During Drilling: Not Encountered | Remarks: Cave in at 18.5' |
| | After Drilling: Not Encountered, Augers Out | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-37**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139420.1 ft<br>**Coordinates** E: 2810256.7 ft | **Station:** 2043 + 76<br>**Offset:** 14 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2591.5 ft |
| **Date Started:**<br>7/26/22 | **Date Finished:**<br>7/26/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Boyd<br>**Logger:** Hilchen | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 15 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 1 - 3 - 4 | | SILT (ML), loose, moist, light gray, [A-4]. Frequent lean clay layers. | | 13 | | | | | | Hollow stem augers with finger bit. |
| | | | | | | | | | | 47 | 20 | 98 | | | |
| 5<br>2586.5 | | | 100 | | 4 - 10 - 11 | | Lean CLAY (CL), very stiff to hard, moist, olive tan, [A-6]. | 4.5<br>2587.0 | 22 | | | | | | |
| | | | 100 | | 6 - 12 - 19 | | | | 21 | 42 | 20 | 99 | | | |
| 10<br>2581.5 | | | 100 | | 6 - 13 - 20 | | Shaley CLAYSTONE, olive tan, soft to very soft field hardness. | 9.2<br>2582.3 | 20 | | | | | | |
| | | | 100 | | 8 - 21 - 36 | | | | 17 | | | | | | |
| 15<br>2576.5 | | | 100 | | 7 - 14 - 27 | | | | 16 | | | | | | |
| 20<br>2571.5 | | | 100 | | 6 - 17 - 34 | | | | 18 | | | | | | |
| | | | | | | | SANDSTONE, tan to gray, fine grained, very soft field hardness. Poorly cemented. Frequent siltstone seams. | 22.2<br>2569.3 | | | | | | | |
| 25<br>2566.5 | | | 100 | | 14 - 35 - 50/0.4ft | | | | 18 | | | | | | |
| 30 | | | | | | | | | | | | | | | |
| 2561.5 | | | | | | | | | | | | | | | |

**Water Level Observations**

- During Drilling: **40.2 ft** *(2551.3 ft)*
- End of Drilling: **39.8 ft** *(2551.7 ft), Augers In*
- After Drilling: **39.8 ft** *(2551.7 ft) +0.3 hrs, Augers Out*

Remarks: Boring cave-in depth not measured.

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-37**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1139420.1 ft<br>**Coordinates** E: 2810256.7 ft | **Station:** 2043 + 76<br>**Offset:** 14 ft L |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2591.5 ft |
| **Date Started:**<br>7/26/22 | **Date Finished:**<br>7/26/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Boyd<br>**Logger:** Hilchen | **Notes:** | | | **PLS TRS-QQ:** 18N 44E 15 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | | 15 - 36 - 45 | | Increased silt content at 34'. | | 13 | | | | | | |
| 35<br>2556.5 | | | 100 | | 11 - 21 - 50 | | | | 20 | | | | | | |
| 40<br>2551.5 | | | 100 | | 16 - 33 - 42 | | | | 24 | | | | | | |
| | | | | | | | Boring Depth: 41.5 ft, *Elevation: 2550.0 ft* | 41.5<br>2550.0 | | | | | | | |

| Water Level Observations | | Remarks: Boring cave-in depth not measured. |
|---|---|---|
| During Drilling: **40.2 ft** ***(2551.3 ft)*** | | |
| End of Drilling: **39.8 ft** ***(2551.7 ft), Augers In*** | After Drilling: **39.8 ft** ***(2551.7 ft) +0.3 hrs, Augers Out*** | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-38**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138778.8 ft<br>**Coordinates** E: 2795054.3 ft | **Station:** 1891 + 60<br>**Offset:** 8 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2450.2 ft |
| **Date Started:**<br>8/16/22 | **Date Finished:**<br>8/17/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Higdon<br>**Logger:** Jaynes | **Notes:** Timber Creek interior bent. | | | **PLS TRS-QQ:** 18N 44E 18 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 90 | | 2 - 2 - 2 | | TOPSOIL, SILT with sand (ML), very loose, dry, light brown to tan, [A-4]. Thin roots. | 0.3<br>2449.9 | 16 | | | | | | Hollow stem augers with finger bit. |
| | | | 63 | | WH - 1 - 1 | | SILT with sand (ML), very loose, dry, light brown to tan, [A-4]. Grayish brown with frequent iron oxide staining at 0.5'. | | 22 | | | | | | |
| 5<br>2445.2 | | | | | | | SILTSTONE, light gray, very soft field hardness. Poorly lithified. Classifies as ML / A-4 when mechanically processed. | 5.0<br>2445.2 | | | | | | | |
| | | | 100 | | 5 - 12 - 17 | | | | 16 | | | | | | |
| 10<br>2440.2 | | | | | | | | | | | | | | | |
| | | | 100 | | 7 - 12 - 17 | | | ▽ | 18 | | NP | 72 | | | |
| 15<br>2435.2 | | | | | | | | | | | | | | | |
| | | | 100 | | 11 - 17 - 21 | | | | 21 | | | | | | |
| 20<br>2430.2 | | | | | | | | | | | | | | | |
| | | | 100 | | 10 - 16 - 23 | | Light gray claystone layer 23.7'-24'. | | 18 | | | | | | |
| 25<br>2425.2 | | | | | | | | | | | | | | | |
| | | | 100 | | 12 - 18 - 25 | | | | 24 | | NP | 55 | | | |
| 30<br>2420.2 | | | | | | | | | | | | | | | |

| Water Level Observations | | |
|---|---|---|
| ▽ End of Drilling: | ▽ During Drilling: **14.0 ft** *(2436.2 ft)* | Remarks: Water levels not measured at End of Drilling or After Drilling due to coring operations. |
| | ▼ After Drilling: | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-38**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138778.8 ft<br>**Coordinates** E: 2795054.3 ft | **Station:** 1891 + 60<br>**Offset:** 8 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2450.2 ft |
| **Date Started:**<br>8/16/22 | **Date Finished:**<br>8/17/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Higdon<br>**Logger:** Jaynes | **Notes:** Timber Creek interior bent. | | | **PLS TRS-QQ:** 18N 44E 18 - BA<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 86.2 | 40 | | | | | | | | | 43 | 114 | 29.5': Switched to HQ coring with carbide surface set bit and water & polymer. |
| | | | | | | | | | | | | | 82 | 114 | |
| | | | | | | | | 32.9 | | | | | | | |
| | | | | | | | CLAYSTONE, light gray, soft to very soft field hardness. | 2417.3 | | | | | 83 | 116 | |
| | | | | | | | | 34.0 | | | | | | | |
| 35 | | | | | | | COAL, black. | 2416.2 | | | | | | | |
| 2415.2 | | | 100 | 46 | | | | 35.8 | | | | | | | |
| | | | | | | | CLAYSTONE, dark gray, soft to very soft field hardness. Frequent thin black coal fragments. Light gray at 37.4'. | 2414.4 | | | | | 120 | 125 | |
| | | | | | | | | 37.6 | | | | | 54 | 122 | |
| | | | | | | | SILTSTONE, gray, soft to very soft field hardness. Occasional black coal fragments. | 2412.6 | | | | | | | |
| 40 | | | | | | | | | | | | | | | |
| 2410.2 | | | 100 | 58 | | | | | | | | | 44 | 106 | |
| | | | | | | | | | | | | | 207 | 115 | |
| | | | | | | | | 41.6 | | | | | | | |
| | | | | | | | CLAYSTONE, dark gray, soft field hardness. Hard, gray sandstone gravel clast at 41.6'-41.7'. | 2408.6 | | | | | | | |
| | | | | | | | | 41.8 | | | | | | | |
| | | | | | | | | 2408.4 | | | | | | | |
| | | | | | | | COAL, black. | 43.7 | | | | | | | |
| | | | | | | | | 2406.5 | | | | | | | |
| 45 | | | | | | | CLAYSTONE, dark gray, soft to very soft field hardness. Frequent thin black coal fragments. | | | | | | 64 | 115 | |
| 2405.2 | | | 100 | 72 | | | | | | | | | 44 | 112 | |
| | | | | | | | | | | | | | 79 | 115 | |
| | | | | | | | | | | | | | 104 | 113 | |
| | | | | | | | | | | | | | 42 | 117 | |
| | | | | | | | Blue-gray at 47.4'. | | | | | | | | |
| | | | | | | | | | | | | | 42 | 118 | |
| | | | | | | | | | | | | | 63 | 120 | |
| 50 | | | | | | | | | | | | | 67 | 119 | |
| 2400.2 | | | 96 | 66 | | | | | | | | | 162 | 125 | |
| | | | | | | | | | | | | | 188 | 122 | |
| | | | | | | | | 51.4 | | | | | | | |
| | | | | | | | SILTSTONE, blue-gray, very soft field hardness. Poorly lithified. Hard, light gray sandstone gravel clast 51.1'-51.3'. | 2398.8 | | | | | | | |
| | | | | | | | | 52.4 | | | | | | | |
| | | | | | | | | 2397.8 | | | | | | | |

Boring Depth: 52.4 ft, *Elevation: 2397.8 ft*

| Water Level Observations | | |
|---|---|---|
| End of Drilling: | During Drilling: **14.0 ft** ***(2436.2 ft)*** | Remarks: Water levels not measured at End of Drilling or After Drilling due to coring operations. |
| | After Drilling: | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-39**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138939.5 ft<br>**Coordinates** E: 2799379.7 ft | **Station:** 1934 + 88<br>**Offset:** 24 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2454.3 ft |
| **Date Started:**<br>8/23/22 | **Date Finished:**<br>8/24/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Higdon<br>**Logger:** Kettner | **Notes:** Skull Creek interior bent. | | | **PLS TRS-QQ:** 18N 44E 17 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILT with sand (ML), very loose, moist, tan to brown, [A-4]. Frequent organics. | | | | | | | | Hollow stem augers with finger bit. |
| 5<br>2449.3 | | | 100 | | WH - 1 - 1 | | | | 26 | | | | | | |
| | | | | | | | Frequent lean clay seams from 7.0' to 14.5'. | | | | | | | | |
| 10<br>2444.3 | | | 100 | | 1 - 2 - 1 | | | | 26 | | NP | 80 | | | |
| | | | | | | | | 14.5<br>2439.8 | | | | | | | |
| 15<br>2439.3 | | | 100 | | 11 - 18 - 30 | | Sandy SILTSTONE, gray, very soft to soft field hardness. | | 17 | | | | | | |
| 20<br>2434.3 | | | 100 | | 12 - 18 - 23 | | Thin coal seams 20.7'-20.8'. | | 23 | | | | | | 20.0': Switched to HQ coring with carbide surface set bit and water. |
| | | | 100 | 10 | | | COAL, black. | 22.5<br>2431.8 | 23 | | | | 37 | 107 | |
| 25<br>2429.3 | | | | | | | Brown-tan iron rich siltstone layer 24.5'-25.9'. | | | | | | | | |
| | | | | | | | Sandy SILTSTONE, gray, very soft to soft field hardness. Frequent coal seams. | 25.8<br>2428.5 | | | | | 9 | 105 | |
| | | | 90 | 10 | | | High angle fractures at 27.4' and 28.6'. | | | | | | | | |
| 30 | | | | | | | COAL, black. | 29.2<br>2425.1 | | | | | | | |
| 2424.3 | | | | | | | | | | | | | | | |

| Water Level Observations | | |
|---|---|---|
| End of Drilling: | During Drilling: Not Encountered | Remarks: Water levels not measured at End of Drilling or After Drilling due to coring operations. |
| | After Drilling: | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

MONTANA MDT DEPARTMENT OF TRANSPORTATION

# LOG OF BORING

**Boring 9726000-39**



| | | | | |
|---|---|---|---|---|
| **Project:** Flowing Wells-E&W | | **Rig:** CME 1050<br>**Hammer:** Auto | **Boring Location** N: 1138939.5 ft<br>**Coordinates** E: 2799379.7 ft | **Station:** 1934 + 88<br>**Offset:** 24 ft R |
| **Project Number:**<br>NH 57-5(55)247 | **UPN:**<br>9726000 | **Boring Diameter:**<br>8" | **System:** MT S.P. (E)<br>**Datum:** NAD83 | **Ground Elevation:** 2454.3 ft |
| **Date Started:**<br>8/23/22 | **Date Finished:**<br>8/24/22 | **Drilling Fluid:**<br>None | **Location Source:**<br>Surveyed | **Elevation Source:**<br>Surveyed |
| **Driller:** Higdon<br>**Logger:** Kettner | **Notes:** Skull Creek interior bent. | | | **PLS TRS-QQ:** 18N 44E 17 - BB<br>**Abandonment:** Cuttings |

| Depth (ft) / Elev. (ft) | Operation | Sample Type | Recovery (%) | RQD (%) | Blow Count | Lithology | Material Description | Depth (ft) / Elev. (ft) | MC (%) | LL | PL | -200 (%) | Qu (psi) | DD (pcf) | Remarks and Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100 | 23 | | | Sand healed fractures 30'-31.5'. | | | | | | | | |
| | | | | | | | CLAYSTONE, gray, very soft to soft field hardness. | 33.1<br>2421.2 | | | | | 41<br>59 | 112<br>115 | |
| 35<br>2419.3 | | | | | | | Sandy SILTSTONE, gray, very soft to soft field hardness. | 35.1<br>2419.2 | | | | | 228<br>299<br>261<br>167 | 115<br>117<br>115<br>114 | |
| | | | 100 | 47 | | | Coal seam 38.1'-38.2'. | | | | | | | | |
| 40<br>2414.3 | | | | | | | | | | | | | | | |
| | | | 50 | 0 | | | | | | | | | | | |
| 45<br>2409.3 | | | | | | | | | | | | | 133 | 121 | |
| | | | 80 | 37 | | | | | | | | | | | |
| 50<br>2404.3 | | | | | | | Boring Depth: 50.0 ft, *Elevation: 2404.3 ft* | 50.0<br>2404.3 | | | | | | | |

| Water Level Observations | | |
|---|---|---|
| End of Drilling: | During Drilling: **Not Encountered** | Remarks: Water levels not measured at End of Drilling or After Drilling due to coring operations. |
| | After Drilling: | |

(2) MDT LOG OF BORING - MDT_2016+WELL_V1.GDT - 9/29/22 08:43 - G:\PROJECTS\2018+PROJECTS\9726000.GPJ

# STANDARD PROVISIONS INDEX

General Decision Number: MT20250079 01/03/2025

Superseded General Decision Number: MT20240079

State: Montana

Construction Type: Highway

Counties: Montana Statewide

HIGHWAY CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

| | |
|---|---|
| If the contract is entered into on or after January 30,2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022. | Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least $17.75 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 2025. |
| If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022. | Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours performing on that contract in 2025. |

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at https://www.dol.gov/agencies/whd/government-contracts

| Modification Number | Publication Date |
|---|---|
| 0 | 01/03/2025 |

SUMT2023-001 04/01/2022

| | Rates | Fringes |
|---|---|---|
| **CARPENTER** | | |
| Carpenter/Piledriverman | $ 36.05 | 14.23 |
| Millwright | $ 40.87 | 14.70 |
| **CEMENT MASON/CONCRETE FINISHER** | $ 33.41 | 16.51 |
| **DIVER** | | |
| Diver Tender | $ 45.30 | 18.38 |
| Diving | $ 92.66 | 18.38 |
| Stand-By | $ 46.33 | 18.38 |

The tender shall receive 2 hours at the straight time pay rate per shift for dressing and/or undressing 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.

| | | |
|---|---|---|
| **ELECTRICIAN (LINE CONSTRUCTION)** | | |
| Equipment Operator | $ 38.38 | 18.60 |
| Groundman | $ 29.96 | 17.64 |
| Lineman | $ 50.11 | 19.88 |
| **ELECTRICIAN** | | |
| All Areas | $ 39.08 | 20.00 |
| **IRONWORKER** | $ 30.43 | 25.22 |
| **LABORER** | | |
| Group 1 | $ 27.71 | 12.36 |
| Group 2 | $ 30.87 | 12.36 |
| Group 3 | $ 31.10 | 12.36 |
| Group 4 | $ 32.12 | 12.36 |

**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; Riprapper; Sealants for Concrete and other materials; Sign Erection, Guard Rail and Jersey Rail; Stake Jumper; Spike Driver; Signalman; Tail Hoseman; 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

| | | |
|---|---|---|
| **PAINTER** | $ 36.00 | 12.84 |

| | | |
|---|---|---|
| **POWER EQUIPMENT OPERATOR:** | | |
| Group 1 | $ 32.47 | 12.77 |
| Group 2 | $ 34.55 | 12.77 |
| Group 3 | $ 35.70 | 12.77 |
| Group 4 | $ 36.67 | 12.77 |
| Group 5 | $ 38.05 | 12.77 |
| Group 6 | $ 39.27 | 12.77 |
| Group 7 | $ 41.95 | 12.77 |

**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; Pumpman

**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)

**TRUCK DRIVER**

| | | |
|---|---|---|
| Group 1 | $ 28.21 | 12.57 |
| Group 2 | $ 35.74 | 12.57 |

**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

**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

https://www.dol.gov/agencies/whd/government-contracts

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) (iii)).

---

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

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", “”SA””, or “”SC”” denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate 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. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the 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. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

“”SU”” wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA

reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the “”SA”” identifier took effect under state law in the state from which the rates were adopted.

---

WAGE DETERMINATION APPEALS PROCESS

Has there been an initial decision in the matter? This can be:

*a survey underlying a wage determination
*an existing published wage determination
*an initial WHD letter setting forth a position on a wage determination matter
*an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

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

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

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

If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail 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 any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

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.

==========

END OF GENERAL DECISION

**"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

FHWA-1273 – Revised October 23, 2023

**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, United States Code, as required in 23 CFR 633.102(b) (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). 23 CFR 633.102(e).

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. 23 CFR 633.102(e).

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) in accordance with 23 CFR 633.102. 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 solicitation-for-bids or request-for-proposals 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). 23 CFR 633.102(b).

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. 23 CFR 633.102(d).

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. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

**II. NONDISCRIMINATION** (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A 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 Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), 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 Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), 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 Part 230, Subpart A, 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 (*see* 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 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 Part 35 and 29 CFR Part 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. 23 CFR 230.409 (g)(4) & (5).

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, sexual orientation, gender identity, 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 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 or other knowledgeable company official.

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, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure 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. 23 CFR 230.409. 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, sexual orientation, gender identity, 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, sexual orientation, gender identity, 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 thereunder. 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, sexual orientation, gender identity, 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, 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. Assurances Required:**

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:
(1) Withholding monthly progress payments;
(2) Assessing sanctions;
(3) Liquidated damages; and/or
(4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

**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 more than $10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, 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, sexual orientation, gender identity, 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), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

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** (29 CFR 5.5)

a. *Wage rates and fringe benefits.* All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), 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 basic hourly 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. As provided in paragraphs (d) and (e) of 29 CFR 5.5, the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act (40 U.S.C. 3141(2)(B)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.e. 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 must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in paragraph 4. of this section. 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 classifications and wage rates conformed under paragraph 1.c. of this section) and the Davis-Bacon poster (WH–1321) must 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. *Frequently recurring classifications.* (1) In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in 29 CFR part 1, a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to paragraph 1.c. of this section, provided that:

(i) The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;

(ii) The classification is used in the area by the construction industry; and

(iii) The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.

(2) The Administrator will establish wage rates for such classifications in accordance with paragraph 1.c.(1)(iii) of this section. Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

c. *Conformance.* (1) The contracting officer must 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 be classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate 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 used 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) The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

(3) 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 will be sent by the contracting officer by email to *DBAconformance@dol.gov*. 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.

(4) 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 will, by email to *DBAconformance@dol.gov*, refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The 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.

(5) The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division under paragraphs 1.c.(3) and (4) of this section. The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 1.c.(3) or (4) of this section must be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

d. *Fringe benefits not expressed as an hourly rate.* 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 may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

e. *Unfunded plans.* 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, in accordance with the criteria set forth in § 5.28, 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.

f. *Interest.* In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

**2. Withholding** (29 CFR 5.5)

a. *Withholding requirements.* The contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in this section for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in paragraph 3.d. of this section, the contracting agency may on its own initiative and 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.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with paragraph

2.a. of this section or Section V, paragraph 3.a., or both, over claims to those funds by:

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its reprocurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

**3. Records and certified payrolls** (29 CFR 5.5)

a. *Basic record requirements* (1) *Length of record retention.* All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

(2) *Information required.* Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; 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 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.

(3) *Additional records relating to fringe benefits.* Whenever the Secretary of Labor has found under paragraph 1.e. of this section 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 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act, the contractor must 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.

(4) *Additional records relating to apprenticeship.* Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

b. *Certified payroll requirements* (1) *Frequency and method of submission.* The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to the contracting agency. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system.

(2) *Information required.* The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under paragraph 3.a.(2) of this section, except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker ( *e.g.,* the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH–347 or in any other format desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division website at *https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/wh347/.pdf* or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to the contracting agency.

(3) *Statement of Compliance.* Each certified payroll submitted must be accompanied by a “Statement of Compliance,” signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

(i) That the certified payroll for the payroll period contains the information required to be provided under paragraph 3.b. of this section, the appropriate information and basic records are being maintained under paragraph 3.a. of this section, and such information and records are correct and complete;

(ii) That each laborer or mechanic (including each helper and apprentice) working 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 29 CFR part 3; and

(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(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.

(4) *Use of Optional Form WH–347.* The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 will satisfy the requirement for submission of the “Statement of Compliance” required by paragraph 3.b.(3) of this section.

(5) *Signature.* The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

(6) *Falsification.* The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 3729.

(7) *Length of certified payroll retention.* The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

c. *Contracts, subcontracts, and related documents.* The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

d. *Required disclosures and access* (1) *Required record disclosures and access to workers.* The contractor or subcontractor must make the records required under paragraphs 3.a. through 3.c. of this section, and any other documents that the contracting agency, the State DOT, the FHWA, or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by § 5.1, available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

(2) *Sanctions for non-compliance with records and worker access requirements.* If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such workers, 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, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to § 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under 29 CFR part 6 any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

(3) *Required information disclosures.* Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address of each covered worker, and must provide them upon request to the contracting agency, the State DOT, the FHWA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

**4. Apprentices and equal employment opportunity** (29 CFR 5.5)

a. *Apprentices* (1) *Rate of pay.* Apprentices will be permitted to work at less than the predetermined rate for the work they perform 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 (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) *Fringe benefits.* Apprentices must 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, fringe benefits must be paid in accordance with that determination.

(3) *Apprenticeship ratio.* The allowable ratio of apprentices to journeyworkers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to paragraph 4.a.(4) of this section. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph 4.a.(1) of this section, must 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 this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(4) *Reciprocity of ratios and wage rates.* Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

b. *Equal employment opportunity.* The use of apprentices and journeyworkers under this part must be in conformity with

the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

c. 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. 23 CFR 230.111(e)(2). 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 journeyworkers 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 as provided in 29 CFR 5.5.

**6. Subcontracts**. The contractor or subcontractor must insert FHWA-1273 in any subcontracts, along with the applicable wage determination(s) and such other clauses or contract modifications as the contracting agency may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate. 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 as provided in 29 CFR 5.5.

**9. Disputes concerning labor standards.** As provided in 29 CFR 5.5, 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 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 40 U.S.C. 3144(b) or § 5.12(a).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of 40 U.S.C. 3144(b) or § 5.12(a).

c. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, 18 U.S.C. 1001.

**11. Anti-retaliation**. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, this part, or 29 CFR part 1 or 3;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, this part, or 29 CFR part 1 or 3;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, this part, or 29 CFR part 1 or 3; or

d. Informing any other person about their rights under the DBA, Related Acts, this part, or 29 CFR part 1 or 3.

## V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), 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 watchpersons 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. 29 CFR 5.5.

**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 and interest from the date of the underpayment. 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 watchpersons and guards, employed in violation of the clause set forth in paragraph 1. of this section, in the sum currently provided in 29 CFR 5.5(b)(2)* 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.

* $31 as of January 15, 2023 (See 88 FR 88 FR 2210) as may be adjusted annually by the Department of Labor, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990.

**3. Withholding for unpaid wages and liquidated damages**

a. *Withholding process.* The FHWA or the contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this section on this contract, 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 that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with Section IV paragraph 2.a. or paragraph 3.a. of this section, or both, over claims to those funds by:

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its reprocurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

**4. Subcontracts.** The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs 1. through 5. of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1. through 5. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

**5. Anti-retaliation.** It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or

d. Informing any other person about their rights under CWHSSA or this part.

**VI. SUBLETTING OR ASSIGNING THE CONTRACT**

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

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” in paragraph 1 of Section VI 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: (based on longstanding interpretation)

(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. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), 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. Pursuant to 23 CFR 635.116(c), 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. (based on long-standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

**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 Part 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. 23 CFR 635.108.

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 Part 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). 29 CFR 1926.10.

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 Part 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 11, 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** (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of $150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.327.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.327.

**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. 2 CFR 180.220 and 1200.220.

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. 2 CFR 180.320.

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. 2 CFR 180.325.

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. 2 CFR 180.345 and 180.350.

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, Subpart I, 180.900-180.1020, and 1200. “First Tier Covered Transactions” refers to any covered transaction between a recipient or subrecipient 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 recipient or subrecipient 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. 2 CFR 180.330.

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. 2 CFR 180.220 and 180.300.

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. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. 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 System for Award Management website (https://www.sam.gov/). 2 CFR 180.300, 180.320, and 180.325.

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 CFR 180.325.

* * * * *

**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 CFR 180.335;.

(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, 2 CFR 180.800;

(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, 2 CFR 180.700 and 180.800; 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. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

* * * * *

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

(Applicable to all subcontracts, purchase orders, and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant 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. 2 CFR 180.365.

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, Subpart I, 180.900 – 180.1020, 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 recipient or subrecipient 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 recipient or subrecipient 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. 2 CFR 1200.220 and 1200.332.

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. 2 CFR 180.220 and 1200.220.

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 System for Award Management website (https://www.sam.gov/), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

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. 2 CFR 180.325.

* * * * *

**4. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:**

a. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(1) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(2) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(3) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing appropriations act requirements)

b. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should 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 Part 20, App. A.

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.

**XII. USE OF UNITED STATES-FLAG VESSELS:**

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To 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. 46 CFR 381.7.

2. To 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 paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS** (23 CFR 633, Subpart B, Appendix B)
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.

## SPECIAL PROVISIONS

## EEO AFFIRMATIVE ACTION REQUIREMENTS ON FEDERAL & FEDERAL-AID CONSTRUCTION CONTRACTS

Federal-aid contractors are hereby notified they are subject to the OFCCP goals and economic areas 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.

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** (statewide) 6.9%

**GOALS FOR MINORITY PARTICIPATION IN EACH TRADE**
Economic Areas:

152
Non-SMSA (Standard Metropolitan Statistical Area) Counties 4.4%
Daniels, Richland, Roosevelt, Sheridan

153 Great Falls, MT
SMSA Counties
3040 Great Falls, MT 3.2%
Cascade

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, Lake, Lincoln, Madison, Mineral, Missoula, Powell, Ravalli, Sanders, Silver Bow

155 Billings, MT
SMSA Counties
0880 Billings, MT 3.3%
Yellowstone

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

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

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

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