CONTRACT NO. 06921

Backsfed.101421

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 October 14, 2021. All bids will then be publicly opened, reviewed for correctness, and then publicly read in the Department's auditorium.

Federal Aid Project(s):

IM 90-1(236)5 Dena Mora Rest Area Rehab

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

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

CONTRACT #: 06921
AWARDED ON: OCTOBER 26, 2021
TO: NORTHWEST GRADING INC

MONTANA DEPARTMENT OF TRANSPORTATION

Loran Frazier, Chairperson
Montana Transportation Commission

Malcolm “Mack” Long
Director of Transportation

Contract No.06921
PB:ST:9432001AWD-101

AWARD COPY

CURRENT QUESTIONS & ANSWERS

101 - DENA MORA REST AREA REHAB - October 14, 2021

Notifications

No Notices available for this project.

Addendums

No Addendums available for this project.

Clarifications

-1-

Submitted: Monday 20-SEP-2021 01:57PM

The correct Project Number is IM 90-1(236)**5**. The project number will be corrected on the Award set of plans and contract.

Questions

-1-

Submitted: Thursday 07-OCT-2021 01:01 PM

Company: Dick Anderson Construction

Contact: Louie Miller

Sheet 16, detail 1. NE corner. What type of CMU should the 8' high portion of the CMU wall extending east past the east end of the building be? Double split face? Same sheet and detail. What type of CMU should the north/south running interior wall be? Single sided split face or colored smooth? Sheet 11, typical calls for insulating all non-grouted cells. What kind of insulation is required? Thank you

Answer

Submitted: Tuesday 12-OCT-2021 08:04AM

1. Double Split Face
2. Single Sided Split Face
3. Loose fill foam insulation to be used in non-grouted CMU cells.

CMU types to be used as follows:

- Exterior/ Interior Walls - Single sided Split Face (split face @ exterior)
- Exterior Walls (Wing Walls) – Double Split face

MONTANA DEPARTMENT OF TRANSPORTATION
SCHEDULE OF ITEMS

CONTRACT ID: 06921

PROJECT: IM 90-1(236)5 (9432236001)
DENA MORA REST AREA REHAB

PROP LINE NO.	ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY
	SECTION 0001 - REHAB REST AREA			
0010	104 030 010	MISCELLANEOUS WORK	UNIT	20,000.00
0020	104 030 025	MISCELLANEOUS ITEMS-INSTALL	EACH	2.00
0030	104 030 035	MISCELLANEOUS ITEMS-REPAIR	LS	1.00
0040	104 030 070	MISCELLANEOUS ITEMS-REMOVAL	LS	1.00
0050	105 070 000	CONTRACTOR SURVEY AND LAYOUT	LS	1.00
0060	109 200 005	MOBILIZATION	LS	1.00
0070	208 010 150	TEMPORARY EROSION CONTROL-LS	LS	1.00
0080	208 010 200	TEMPORARY EROSION CONTROL-FIXED	UNIT	500.00
0090	603 013 460	PIPE-PVC 6 IN SANITARY	LNFT	210.00
0100	603 013 670	DUCTILE IRON PIPE 4 IN	LNFT	5.00
0110	603 017 030	DEWATERING	LS	1.00
0120	608 010 020	SIDEWALK-CONCRETE 4 IN	SQYD	3.00
0130	610 100 559	REVEGETATION	LS	1.00
0140	610 501 060	REHABILITATE BUILDING	LS	1.00
0150	610 513 200	BUILDING - MISC	LS	1.00
0160	618 030 015	TRAFFIC CONTROL-FIXED	UNIT	500.00
0170	618 030 080	TRAFFIC CONTROL-LS	LS	1.00

TABLE OF CONTENTS
FEDERAL AID PROJECT(S) IM 90-1(236)5

1. PROJECT DESCRIPTION [102] 5
2. CONTRACT TIME [108] (REVISED 1-21-16) 5
3. CONTRACT DOCUMENTS [102] (ADDED 9-17-20) 5
4. DISADVANTAGED BUSINESS ENTERPRISES (DBE) REQUIREMENTS [102] (REVISED 1-18-18) 6
5. DBE QUOTES [102] (REVISED 3-10-16) 6
6. DBE USAGE [102] (REVISED 2-13-20 M) 6
7. LABOR REQUIREMENTS [102] (REVISED 9-5-19) 6
8. CERTIFIED PAYROLL COMPLIANCE ELECTRONIC PAYROLL SUBMISSION [102] (REVISED 3-12-20) 7
9. ZONE PAY [102] (REVISED 5-10-18) 7
10. BIDDING REQUIREMENTS – PROPOSAL GUARANTEE [102] (REVISED 12-17-20) 7
11. DELIVERY AND PUBLIC OPENING OF PROPOSALS [102] (ADDED 9-17-20) 7
12. SOIL BORING INFORMATION 7
13. 103.07 EXECUTION AND APPROVAL OF CONTRACT [103] (ADDED 6-13-19) 8
14. SUBMISSION OF CERTIFIED CLAIMS [105] (ADDED 4-23-20) 8
15. PARTNERING- LEVEL II FACILITATION [105] (ADDED 2-25-21) 10
16. STEEL PRICE ADJUSTMENT [106] (REVISED 4-25-19) 10
17. DEPARTMENT CONSTRUCTION TRAINING [108] (ADDED 3-25-21) 11
18. SUBCONTRACTING CONSULTANTS [108] (REVISED 2-27-14 M) 11
19. NOTICE TO BIDDERS [108] (ADDED 11-21-08) 11
20. SUBCONTRACTING [108] (ADDED 9-23-21) 12
21. BILLING CYCLE [109] (ADDED 8-12-21) 12
22. GROUNDWATER & DEWATERING 12
23. ENVIRONMENTAL SPECIFICATIONS [208] (ADDED 9-9-21M) 13
24. STORM WATER PERMITTING REQUIREMENTS UNDER THE MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM (MPDES) [208] (REV 3-16-17) 13
25. SPECIALTY ITEM TECHNICAL SPECIFICATIONS 15
26. ELECTRICAL 15
27. TRAFFIC CONTROL PLAN & SEQUENCE OF OPERATIONS 15
28. TRAFFIC CONTROL DEVICES – PLASTIC DRUMS [618] (REVISED 1-23-20) 16
29. EXISTING SPRINKLER AND IRRIGATION SYSTEMS 16
30. MEASUREMENT AND PAYMENT 17
31. REVEGETATION 20

SECTION II
Nondiscrimination Notice
Specifications Volume 2
Specifications Volume 3
Logs of Boring

SECTION III
Standard Provisions & Requirements

SPECIAL PROVISIONS

FEDERAL AID PROJECT NO(S). IM 90-1(236)5

(REVISED 09-09-21)

The following special provisions are hereby made part of the contract and supplement and/or supersede any sections of the Standard and Supplemental 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:

- "Standard and Supplemental Specifications for Road and Bridge construction 2020 V2.3 Edition" found at the following link: https://www.mdt.mt.gov/other/webdata/external/const/specifications/2020/SPEC-BOOK/2020-SPEC-BOOK-V2.3.pdf
- The most recent version of the Detailed Drawings can be found at the following link: https://www.mdt.mt.gov/business/contracting/detailed_drawings.shtml

The most recent version of the Materials Manual can be found at the following link: https://www.mdt.mt.gov/other/webdata/external/materials/materials_manual/MDT_MATERIALS_MANUAL_090921_LETTING.pdf

- The latest version of the Standard and Supplemental Specifications, Quarterly 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. Questions raised by potential bidders on this project and answers and other information posted by the Department on the "Question and Answer Forum" can be found at the website https://www.mdt.mt.gov/business/contracting/qacurrent.shtml up to 5 p.m. on the day before the bid letting.

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

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

1. PROJECT DESCRIPTION [102]

Rehabilitation of the existing wastewater collection and treatment system on the Dena Mora Rest Area Rehab project located in Mineral County. The project is located on the east and west sides of Interstate Route 90 between RP 4.6 and RP 4.7. Work includes replacement of septic tanks, pipes and lining of tanks.

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 90 Working Days. The NTP will be issued with an effective date of July 11, 2022.

3. CONTRACT DOCUMENTS [102] (ADDED 9-17-20)

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/ :

- Table of Contractor's Submittals
- Traffic Control Rate Schedule
- Erosion Control Rates

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

The DBE goal for this contract is 0%. Use the AASHTOWare Project Bids™ Electronic Bid System (EBS) to print the DBE submittal and timing requirements. If the contract does not have a project-specific goal, the field will display in the AASHTOWare Project Bids™ bid file as a blank field.

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

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

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

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

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

6. DBE USAGE [102] (REVISED 2-13-20 M)

Contract specific goals are not placed on contracts; however, the Department has an overall 6.5% 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 3.3% DBE usage. Although not a contract requirement, the Department believes that the aspirational goal can realistically be achieved through race neutral measures based on current availability of DBEs and standard competitive procurement processes. While the utilization is not mandatory to be awarded the project, continuing utilization of DBE firms on contracts supports the success of Montana's DBE Program.

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

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

Contractors are encouraged to identify any opportunities to subcontract to DBEs.

The Department's DBE directory may be found at the following website: https://app.mdt.mt.gov/dbe/dbe/search.

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

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

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

8. CERTIFIED PAYROLL COMPLIANCE ELECTRONIC PAYROLL SUBMISSION [102] (REVISED 3-12-20)

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

Request the contract number and project ID(s) from the Project Manager. Provide the information to all subcontractors subject to the FHWA 1273 requirements. This information is also available using the Search Awarded Contracts located at: https://app.mdt.mt.gov/project-search/project/search.

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

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

Wage rates and zone pay requirements can be found elsewhere in the proposal. The mileage for determining the zone is 109 miles.

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

10. BIDDING REQUIREMENTS – PROPOSAL GUARANTEE [102] (REVISED 12-17-20)

Subsection 102.07(C)(2), Proposal Guarantee, of the Standard Specifications is hereby rescinded and replaced with the following:

Proposal Guarantee. The bid bond is on the most current version of MDT-CTP-102-07-1; is signed and sealed in the proper places; a copy of the agent's Power of Attorney for the insurance company is attached; and contains the correct and complete project number; all signatures are original (stamped signatures are unacceptable). A qualified third-party surety agency must verify the proposal guarantee. Electronic bid bond verification must be submitted through AASHTOWare Project Bids and Bid Express™ . Contact Bid Express for more information on electronic bid bond verification.

If an error occurs with electronic bid bond verification through AASHTOWare Project Bids and Bid Express, submit the Electronic Bid Bond Form MDT-CTP-102-07-2 in Adobe PDF format via email to mdtcntplns@mt.gov prior to the bid opening. Hard copy or paper bid bonds submitted to the Department will not be accepted. Bids that include submission of a bid bond without electronic verification or Electronic Bid Bond Form CPB_102_07 will be deemed non-responsive.

11. DELIVERY AND PUBLIC OPENING OF PROPOSALS [102] (ADDED 9-17-20)

Subsection 102.10(A) Bid Submission by Sealed Envelope is hereby rescinded.

Submissions by sealed envelope will be deemed non-responsive.

12. SOIL BORING INFORMATION

Description. The Department routinely conducts subsurface investigations to collect soil and rock information within the anticipated limits of upcoming projects. For this contract, soil/rock boring information was not collected but soils information is available from previous projects at the site.

Data Set 1. The first data set is the completion of two soil borings located in the general area of the advanced wastewater treatment system. Soil borings were completed August 2011. The soil boring logs are available upon request.

Data Set 2. The second data set of soils information being made available for reference is from for a previous project, in which the rest area was reconstructed in 2002 – 2003 under project IM 90-1(138)5, Dena Mora Rest Area Reconstruction. The geotechnical evaluation

report was prepared in 1999 for that project, specific to its scope, and is considered only a reference product for subsurface conditions that may be encountered under this current project. The geotechnical evaluation is available upon request.

Data Set 3. The third data set includes a report titled Dena Mora Rest Area Infiltration and Inflow Evaluation and Recommendations Report prepared by CDM Smith on October 16, 2018. The report is available upon request.

"Logs of Borings" are based on an interpretation of the field investigation and laboratory testing data, and do not include all the information that may be available. This information has been edited or abridged and may not reveal all the information which might be useful or of interest to the bidder.

All bidders are expected to fully review the available information, and in a timely manner that allows any questions on the information to be answered in accordance with Department requirements on answering inquiries and issuing project addenda. It is the prime bidder's responsibility to ensure that a firm submitting a Subcontractor quote for the prime's use is aware of all available information.

Submission of a bid without fully reviewing the Department's complete set of field investigation and laboratory testing data or accepting a quote from a Subcontractor without verifying that the Subcontractor reviewed all available data, is a business decision by the bidder. Failing to fully review all available relevant 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 complete file of boring and laboratory data and not shown, or not fully shown, in the boring logs contained in the contract documents.

Soil, rock, and groundwater conditions shown on the available date 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 and will make no adjustment in bid prices if site conditions differ from that shown on the boring logs in the contract.

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

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

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

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

14. SUBMISSION OF CERTIFIED CLAIMS [105] (ADDED 4-23-20)

This provision rescinds and replaces the first two paragraphs of Subsection 105.16.2.

If an agreeable resolution is not reached within 14 calendar days of the written notice, the Contractor may submit a Certified Claim by completing the Certified Claim form MDT-CON-105-16-2 to the Project Manager no more than 7 calendar days after receipt of the Project Manager's response. The form is available from the Project Manager or the Department's website. Include all Claim Cost Records to date with the Certified Claim. Submit electronic

copies to the DCE and the CES Engineer of the Engineering Division. The Project Manager will continue to attempt to resolve the disagreement after the Certified Claim is submitted.

Detail the following, if applicable, in the Certified Claim:

A. Summary. (label page 1.1 through page 1.X) Include a detailed, factual statement of the claim for additional compensation and contract time, if any, with necessary dates and locations of work involved in the claim. Also include detailed facts supporting the Contractor's position.

B. Proof of Notice. (label page 2.1 through page 2.X) Submit notice of claim with all attachments that was furnished to the Department. Include the date when the written notice was given.

C. Supporting Documents. (label page 3.1 through page 3.X) Furnish copies of the contract specifications that support the Contractor's claim.

D. Theory of Entitlement. (label page 4.1 through page 4.X) Include a narrative of how or why the specific contract specifications support the claim.

E. Itemized Lists. (label page 5.1 through page 5.X) Provide an itemized list of claimed damages that resulted from the event with a narrative of the theories and records and documents used to arrive at the value of the damages.

F. Time Requests. (label page 6.1 through page 6.X) Provide additional contract time requests if the claim is for a combination of additional compensation and contract time. Submit a copy of the schedule that was in effect when the event occurred and a detailed narrative which explains how the event impacted contract time. In addition, if the Department-caused delay is claimed, provide the following:

1) Include the specific days and dates under claim;

2) Provide detailed facts about the specific acts or omissions of the Department that allegedly caused the delay, and the specific reasons why the resulting delay was unreasonable; and

3) Provide a schedule evaluation that accurately describes the impacts of the claimed delay.

G. Expense Records. (label page 7.1 through page 7.X) Submit copies of actual expense records. Include documents that contain the detailed records which support and total to the exact amount of additional compensation requested. Include the information and calculations necessary to support that amount. At a minimum, provide the following:

1) Direct materials.

2) Direct equipment. The rate claimed for each piece of equipment not to exceed the actual cost. For each piece of equipment, include a detailed description of the equipment and attachments, specific days and dates of use or standby, and specific hours of use or standby.

3) Direct labor; and

4) Other categories as specified by the Contractor or the Agency.

H. Supporting Records. (label page 8.1 through page 8.X) Provide additional supporting records and documents including copies of, or excerpts from the following:

1) Any documents that support the claim, such as manuals standard to the industry and used by the Contractor; and

2) Any daily reports or diaries related to the event, photographs or media that help explain the issue or event.

I. Certification. (label page 9.1 through 9.X) Provide a certified statement, signed by a representative authorized to execute change orders, by the Contractor, subcontractor, supplier, or entity originating the claim as to the validity of facts and costs

J. Lower Tier Claim. (label page 10.1 through 10.X) If the claim includes work done or costs incurred by any subcontractors, suppliers, or any entity other than the Contractor, the following are required:

1) Copies of the Contractor's, subcontractor's, supplier's and entity's (at all tiers above the level of which the claim originates) separate evaluation of entitlement.

2) Copies of the Contractor's, subcontractor's, supplier's and entity's (at all tiers above the level of which the claim originates) independent verification and evaluation of the amount of damages sought; and

3) An authorized representative to execute change orders on behalf of the Contractor, Subcontractor, Supplier and Entity (at all tiers above the level of which the claim originates).

If the Project Manager determines that additional information, records, or documentation is needed to allow proper evaluation of the claim submittal, the Project Manager will request the information, records, or documentation. Submit the requested information to the Project Manager within14 calendar days.

If the claim includes requests for delay compensation, follow all procedures in Subsection 108.07.6.

15. PARTNERING- LEVEL II FACILITATION [105] (ADDED 2-25-21)

An internal partnering meeting will be facilitated between the Project Manager and the Contractor prior to the Notice to Proceed date.

Implement partnering in accordance with the Montana Partnering Field Guide found at the following link: https://www.mdt.mt.gov/publications/manuals.shtml#con

Make a good-faith effort to settle any unresolved discrepancies by utilizing the Partnering Escalation/Issue Resolution Ladder identified in the Partnering Field Guide prior to submitting a notice of claim.

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

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

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

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

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

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

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

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

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

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

2) Steel Certification and Mill Test Reports.

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

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

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

For Increases:

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

For Decreases:

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

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

17. DEPARTMENT CONSTRUCTION TRAINING [108] (ADDED 3-25-21)

Do not work during the Department's Statewide Construction Training which will be held February 7 through February 12 of 2022. No time will be charged for Contracts with active construction during this period.

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

The following consultant performed work on the project.

- WWC Engineering

19. 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.

20. SUBCONTRACTING [108] (ADDED 9-23-21)

The following changes are made to Subsection 108.01:

1) Within Subsection 108.01.1 Subcontracting, rescind the 4th paragraph which begins "Include in the written subcontract…" and replace with the following:

"Include the following language in the subcontract:"

Rescind the last paragraph and replace with the following:

Do not hire or use in any manner a person or organization that performed any part of the design work for the Department unless first approved by the Department.

2) Within Subsection 108.01.2 Contract Performance, rescind the 4th and 5th paragraphs and replace with:

Do not allow a Subcontractor at any contract tier to start work until a subcontract is consented to by the CES Bureau. Submit fully executed subcontracts in electronic DocuSign PDF format. Scanned PDF subcontracts are not acceptable. Include the Consent of Surety language and Subcontractor Checklist as part of the subcontract agreement, referenced on the Subcontracting Resources webpage:

https://www.mdt.mt.gov/business/contracting/resources.shtml

Inform the Subcontractor of all the contract provisions, and that the Subcontractor is bound by all terms of the prime's contract with the Department. Provide the Subcontractor a copy of all the contract provisions including the applicable Federal Prevailing Wage rates and Required Contract Provisions FHWA 1273. Include in the subcontract the following language:

"The Subcontractor agrees to comply with all of the labor provisions contained in the attached Required Contract Provisions and Federal Prevailing Wage/Davis Bacon Wage Decision."

Rescind the last paragraph and replace with the following:

Department approved consent to subcontract, assign or transfer the contract does not release the Contractor from liability under the contract and bond.

21. BILLING CYCLE [109] (ADDED 8-12-21)

Rescind the last paragraph of subsection 109.06.1 Billing Cycle which begins "Pay all subcontractors." and replace with the following:

Pay all subcontractors within 7 calendar days after receipt of a periodic or final payment from the Department. Payment must be for the full amount due the subcontractor (including retainage) for work performed or materials provided that were included in the periodic or final payment according to the provisions of Section 28-2-2103(2)(a) MCA. A subcontract may not provide for a time longer than the law's mandated 7 calendar days.

22. GROUNDWATER & DEWATERING

Groundwater will be encountered when excavating. Review the project geotechnical evaluation reference and make appropriate provisions for groundwater and necessary dewatering. Previous studies have indicated that groundwater will be experienced at shallow depths or rise to the ground surface during seasonal variations; however, groundwater levels fluctuate over the years and even over the seasons. All excavations that experience groundwater need to be dewatered properly and kept dry at all times. Submit to the Project Manager, for approval, a de-watering plan for installing any structure before starting the work. Provide a plan meeting the requirements of the provision titled Authorization To Discharge Under The Montana Pollutant Discharge Elimination System (MPDES).

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

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

Work in Bear Habitat	Subsection 208.03.4E
AIS Watercraft and Equipment Inspection	Subsection 208.03.2D

24. STORM WATER PERMITTING REQUIREMENTS UNDER THE MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM (MPDES) [208] (REV 3-16-17)

A. Description. The Montana Department of Environmental Quality (DEQ) regulates storm water discharges under the MPDES program. If the bid package contains blank erosion control plans, a construction storm water discharge permit authorization will be required. If not, a storm water discharge permit authorization may be required for this project depending on Contractor's operations. Sum the disturbance area (as defined by DEQ) identified in the contract with the area of disturbance caused by contractor operations to determine if the permit acreage threshold is exceeded. Contractor operations can include, but are not limited to, the following support activities: staging areas, access roads, material storage areas, temporary concrete or asphalt batch plants, borrow areas, areas used for fill placement, etc. If the summed disturbance area is one acre or more, use the DEQ authorization to discharge under the MPDES General Permit for Storm Water Discharges Associated with Construction Activity for this project. In order to facilitate permit transfer, separate NOI packages are required for areas within the right-of-way and areas outside of the right-of-way. A Notice of Intent (NOI) package includes a Notice of Intent, with a topographic map, a Storm Water Pollution Prevention Plan (SWPPP), the erosion control plans, sage grouse consultation letter, if applicable, and supporting documentation.

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

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

C. Construction Requirements.

1) MPDES Permit Required.

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

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

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

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

b) Submit a separate NOI package and the associated fees to DEQ for ground disturbance and support activity areas outside the right-of-way and not shown in the plans. Contractor furnished material sources, staging areas, plant sites, or any other Contractor caused ground disturbance outside the right-of-way and not shown in the plans, are the

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

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

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

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

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

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

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

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

2) MPDES Permit not Required.

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

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

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

E. Basis of Payment. No additional payment will be made for the DEQ MPDES fees and monitoring costs associated with the General Permit for Storm Water Discharges Associated with Construction Activity. Include these costs in the Temporary Erosion Control-Lump Sum bid item.

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

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

25. SPECIALTY ITEM TECHNICAL SPECIFICATIONS

Refer to Volume 2 and 3 of the Special Provisions for requirements.

26. ELECTRICAL

The Contractor is responsible for providing all electrical in accordance with the plans and specifications. A licensed electrician in the State of Montana is required to complete all electrical work shown and described in the plans and specifications. The Contractor is responsible for all permits required for the electrical work. The existing electrical infrastructure and panels appear to be adequate to provide the electrical service needed for each building. The Contractor is required to provide a written and drawn electrical plan for each building to the Project Manager prior to construction. For the chemical feed building addition, the Contractor is required to provide a written and drawn plan for service, wiring, and wire routing for the proposed exterior lighting. For the dose tank building, the Contractor is required to provide a written and drawn plan on how the contractor will relocate the existing dose tank electrical and controls, service, wiring, and wire routing for the proposed interior lights, exterior lights, and exhaust fan. If the Contractor determines the existing electrical panel cannot support the additional electrical needs, the Contractor is required to notify the Project Manager immediately, and the Contractor is required to provide a plan that includes upgrading the electrical panel to support the additional electrical requirements. The Contractor is required to provide the electrical permit for each building to the Project Manager prior to construction.

27. TRAFFIC CONTROL PLAN & SEQUENCE OF OPERATIONS

A. Traffic Control. Establish traffic control to complete the work. It is expected the rest area will be closed to complete work on the wastewater collection and treatment systems. Ensure that the traffic control meets the requirements of the Manual of Uniform Traffic Control Devices (MUTCD) and MDT Detailed Drawings. Use methods that minimize disruption to vehicular and pedestrian traffic through the site. Devices used shall provide reflective panels and sheeting suitable for night time visibility from oncoming vehicle traffic and arranged to take into account the speed of the vehicle approaching the site being delineated. Provide temporary

traffic control signing along the interstate notifying the public that the rest area is closed for maintenance.

B. Stockpile and Storage. Provide traffic control devices and barriers to safely direct traffic around and prevent unauthorized entry into stockpile and storage sites and work zones.

C. Temporary Pedestrian Barriers. Utilize temporary barriers in the traffic control and sequence of operations to delineate the work zones or other areas that have been disturbed by construction but may be work inactive to prevent unauthorized person entry. Temporary barriers for maintaining the public from entering stockpile and equipment locations, work zones, excavations etc. shall be erected for the complete perimeter of the zone to enclose. Barriers, such as security fencing, shall be of a height and of solid construction and foundation to reasonably prevent pedestrians, including children, from climbing over, under, through or tipping to gain access, or otherwise entering the work or storage site.

D. Traffic Control & Sequence of Operations Plan. Prepare the traffic control & sequence of operations plan according to the requirements to construct the project. Provide the plan to the Project Manager a minimum of three weeks prior to mobilization for the Department's review and approval. Make corrections to the plan as directed by the Department through the Project Manager. Do not begin work until receiving an approved plan back from the Project Manager. The Project Manager may restrict or halt contract work at any time he or she determines that the plan does not meet the requirements of this provision. The plan and sequence of operations may need to be modified during the course of the project, if determined by the Project Manager, that a revision to the plan is in the benefit of the traveling public. The plan shall take into consideration that the rest area will be closed during work on the wastewater collection and treatment system. Once work on the wastewater collection and treatment system are complete the rest area shall be opened to the public. The construction of the chemical feed building as well as the dose tank building shall be completed with the rest area open. In addition, the plan and potential modifications to the plan shall take into consideration coordination with other work as further described in this provision.

E. Measurement and Payment. Refer to the special provision title Measurement and Payment.

28. TRAFFIC CONTROL DEVICES – PLASTIC DRUMS [618] (REVISED 1-23-20)

Beginning on April 1, 2021, all plastic drums furnished and installed on Interstate projects must include 6-inch retro-reflective white and retro-reflective fluorescent orange sheeting.

Beginning on April 1, 2022, all plastic drums furnished and installed on all projects must include 6-inch retro-reflective white and retro-reflective fluorescent orange sheeting. All other requirements of Detailed Drawing 618-00 still apply.

29. EXISTING SPRINKLER AND IRRIGATION SYSTEMS

A. Description. Existing sprinkler and/or irrigation systems exist at the rest area site. Do not damage existing sprinkler and/or irrigation systems that are not in conflict. Remedy any damage to systems caused by project activities to the Project Manager's satisfaction.

Repair damaged irrigation components in conflict with the work or by contractor negligence with in-kind components. Prior to work that may damage the irrigation systems, coordinate with Project Manager for approval of location and materials. All irrigation facilities are to be activated and adjusted, if necessary, after construction activities are complete to ensure a leak-free fully operational system, and spray patterns meet Project Manager approval.

B. Payment. If damage is caused to sprinkler irrigation systems that are not in conflict with the proposed work, assume all costs associated with the system repair or replacement of damaged components with no expense to the Department.

Payment for sprinkler and/or irrigation systems in direct conflict with the proposed work will be as Miscellaneous Work, including all labor and materials for an operational system. Document all labor and material costs for approval by the Project Manager for payment.

30. MEASUREMENT AND PAYMENT

A. Description. For the purposes of this project, this Measurement and Payment Section governs and takes precedence over all other references to measurement and payment (with the exception to any addenda).

B. Bid Items. No item that is required by the project for the proper and successful completion of the work, for the project as a whole, to meet the requirements, will be paid for outside of or in addition to the prices submitted in the Bid Proposal. All work not specifically set forth as a pay item in the Bid Proposal is considered a subsidiary obligation of the Contractor and all costs in connection therewith are to be included in the prices bid.

C. Measurement and Payment Bid Item Descriptions.

1) Miscellaneous Work. Measurement and Payment is as specified in the Standard Specifications 104.04 as directed by the Project Manager. In addition, these provisions identify payment for sprinkler and/or irrigation systems in direct conflict with the proposed work as Miscellaneous Work.

2) Misc. Install – Each. Measurement and payment for this bid item is to furnish and install new precast concrete septic tanks in accordance with the plans and specifications. The measurement and payment will include the cost of the following:

a) Excavation and preparation of site for installation of new precast concrete septic tank.

b) Preparation of subgrade in accordance with plans and specifications.

c) All equipment, labor and materials to furnish and install base gravel in accordance with plans and specifications.

d) All equipment, labor, and materials to furnish and install 10,000 gallon precast concrete septic tank in accordance with the plans and specifications. Prior to backfill precast concrete septic tanks shall be tested for water tightness in accordance with ASTM C1244, “Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill”.

e) All equipment, labor, and materials to furnish and install tank backfill in accordance with the plans and specifications.

f) All equipment, labor, and materials to restore all surface conditions as necessary to original or better condition shall be included in the unit price bid.

g) All equipment, labor, and materials to install solar high water alarm in accordance with the plans and specifications.

3) Misc. Repair – Lump Sum. Measurement and Payment for this item is for cleaning and preparation, interior coating of manholes and storage tank, chimney sealant, invert repairs, and manhole lid replacement for the existing manholes and storage tank in accordance with the plans and specifications. The measurement and payment will include the cost of the following:

a) All materials and labor to clean the existing concrete structures as identified in the plans and in accordance with the specifications.

b) All equipment, labor, and materials to furnish and install interior manhole coating in accordance with the plans and specifications.

c) All equipment, labor, and materials to furnish and install interior tank coating in accordance with the plans and specifications.

d) All equipment, labor, and materials to furnish and install manhole and tank riser coating in accordance with the plans and specifications.

e) All equipment, labor, and materials to repair all manhole and tank inlet and outlet pipe in accordance with the plans and specifications.

f) All equipment, labor, and materials to replace all manhole lids in accordance with the plans and specifications.

g) All equipment, labor and materials to raise MH-A lid 1-ft in accordance with the plans and specifications.

h) All equipment, labor, and materials to furnish and place earthen backfill to provide a smooth transitional grade between the adjusted manhole rim elevation and existing ground.

4) Misc. Removal – Lump Sum. Measurement and payment for this bid item is for pumping and disposal of waste from the existing fiberglass septic tanks and the complete removal and disposal of the existing fiber glass septic tanks and ballast as identified on the plans. The measurement and payment include the cost of the following:

a) All equipment and labor to pump existing waste material from existing septic tanks.

b) Transportation and disposal of waste material at an approved facility that accepts septic tank waste. Transportation and disposal of removed materials are considered incidental and shall be included in the unit bid price.

c) Excavation of material to base of existing septic tanks.

d) All equipment and labor to remove and dispose of the existing fiber glass septic tanks. Transportation and disposal of removed materials are considered incidental and shall be included in the unit bid price.

e) All equipment and labor to remove and dispose of existing septic tanks ballast. Transportation and disposal of removed materials are considered incidental and shall be included in the unit bid price.

5) Construction Survey and Layout. Measurement and Payment is by the Lump Sum in accordance to the provision titled Construction Surveying and Layout – Contractor Staking.

6) Temporary Erosion Control – Lump Sum. Measurement and Payment is by the Lump Sum in accordance to the provision titled Temporary Erosion Control – Lump Sum.

7) Pipe-PVC 6 IN Sanitary – LNFT. Measurement and payment for this bid item is as described in the specifications. The measurement and payment include the cost of the following as identified in the plans to a complete installation:

a) All equipment and labor to remove the existing PVC sections of sewer pipe identified on the plans. Trench excavation shall be included in the unit bid price. Transportation and disposal of removed materials are considered incidental and shall be included in the unit bid price.

b) All equipment, labor and materials to furnish and install new PVC pipe in locations identified on the plans.

c) All equipment, labor and materials to connect Connection to the existing line including all fittings.

d) All equipment, labor and materials to furnish and install pipe bedding and backfill in accordance with the plans and specifications.

e) All equipment, labor and materials to restore surface conditions as necessary to original or better condition shall be included in the unit price bid.

f) All equipment, labor and materials to furnish and install new 6-inch PVC cleanout as shown on the plans.

8) Ductile Iron Pipe 4in – LNFT. Measurement and payment for this bid item is as described in the specifications. The measurement and payment include the cost of the following as identified in the plans to a complete installation:

a) All equipment and labor to remove the existing ductile iron sections of sewer pipe identified on the plans. Trench excavation shall be included in the unit bid price. Transportation and disposal of removed materials are considered incidental and shall be included in the unit bid price.

b) All equipment, labor and materials to furnish and install new ductile iron pipe in locations identified on the plans.

c) All equipment, labor and materials to connect new ductile iron pipe to the existing line including all fittings.

d) All equipment, labor and materials to furnish and install pipe bedding and backfill in accordance with the plans and specifications.

e) All equipment, labor and materials to restore all surface conditions as necessary to original or better condition shall be included in the unit price bid.

9) Dewatering – LS. Measurement and Payment is by the Lump Sum in accordance to the provision titled Groundwater and Dewatering. Contractor shall provide dewatering of all excavations in accordance with the specifications.

10) Sidewalk-Concrete 4 in – SQYD. Measurement and payment for this bid item is as described in the specifications. The measurement and payment include the cost of the following as identified in the plans to a complete installation:

a) Clearing and grubbing of area for new sidewalk shown on the plans.

b) All equipment, labor and materials to prepare subgrade in accordance with the specifications.

c) All equipment, labor, and materials to furnish and install base gravel as required by the plans and specifications.

d) All equipment, labor, and materials to form the sidewalk in accordance with the plans and specifications.

e) All equipment, labor and materials to furnish and install concrete in accordance with the plans and specifications.

11) Rehabilitate Building – Lump Sum. Measurement and Payment for this bid item is for the complete construction of the addition to the chemical feed building in accordance with the plans and specifications. The measurement and payment includes the cost of the following in accordance with the plans and specifications:

a) Complete clearing and grubbing of the planned construction as required to prepare the site for excavation and embankment work. Load, Haul and dispose of cleared and grub material at a location chosen by the Contractor off the project site and approved by the Project Manager.

b) Salvage and stockpile topsoil. Replace the topsoil on to the finished slopes of the graded area at the conclusion of embankment and finish grading operations, prior to seeding and fertilizing.

c) All miscellaneous excavation to the grades and elevations required.

d) Dewatering if required.

e) Stockpiling excavation material for backfill.

f) Furnishing and installing shoring support for excavation walls if required.

g) Preparing the excavation foundation to receive footing forms.

h) Furnishing, place and strip all formwork.

i) Constructing the complete chemical feed building addition in accordance with the plans and specifications.

j) Furnishing and installing all exterior and interior building appurtenances, fixtures and miscellaneous building electrical identified in the plans.

k) Backfilling, compacting and finish grading.

l) Preparation of electrical wiring plan and submittal of plan to Project Manager for approval.

m) Complete installation, startup, operations and testing of electrical components.

n) Final as-built and O & M manuals.

o) All other work and materials required, but not otherwise identified herein, to provide the completed building addition.

12) Building Misc. – Lump Sum. Measurement and Payment for this bid item is for the complete construction of the dose tank building in accordance with the plans and specifications. The measurement and payment includes the cost of the following in accordance with the plans and specifications:

a) Demolition and disposal of existing dose tank r control building. Dose tank controls and electrical equipment to remain.

b) Complete clearing and grubbing of the planned construction as required to prepare the site for excavation and embankment work. Load, Haul and dispose of cleared and grub material at a location chosen by the Contractor off the project site and approved by the Project Manager.

c) Salvage and stockpile topsoil. Replace the topsoil on to the finished slopes of the graded area at the conclusion of embankment and finish grading operations, prior to seeding and fertilizing.

d) All miscellaneous excavation to the grades and elevations required.

e) Dewatering if required.

f) Stockpiling excavation material for backfill.

g) Furnishing and installing shoring support for excavation walls if required.

h) Preparing the excavation foundation to receive footing forms.

i) Furnishing, place and strip all formwork.

j) Constructing the complete dose tank building in accordance with the plans and specifications.

k) Furnishing and installing all exterior and interior building appurtenances, fixtures and miscellaneous building electrical identified in the plans.

l) Relocate dose tank controls and electrical as identified in the plans.

m) Backfilling, compacting and finish grading.

n) Preparation of electrical wiring plan and submittal of plan to Project Manager for approval.

o) Complete installation, startup, operations and testing of mechanical and electrical components.

p) Final as-built and O & M manuals.

q) All other work and materials required, but not otherwise identified herein, to provide the completed building addition.

13) Traffic Control - LS. Measurement and Payment for this item is by the Lump Sum to include the cost of completing the work in accordance to the provision titled Traffic Control Plan & Sequence of Operations.

14) Revegetation – LS. Measurement and Payment is by the Lump Sum in accordance to the provision Section 610 Roadside Revegetation.

31. REVEGETATION

A. Description. This work consists of providing the necessary equipment and materials to accomplish revegetation of all areas disturbed by construction and/or directed by the project manager.

B. Construction Requirements. Salvage and/or furnish sufficient quantities of topsoil meeting Std Spec 713.05 to place 4 inches over all disturbed areas. Immediately following topsoil placement, broadcast seed non-irrigated areas with the following seed mix and equivalent rates. After seeding, rake or scarify the soil to incorporate the seed to an approximate depth of ¼ to ½ inch.

Re-sod or reseed disturbed irrigated lawn areas with a locally adapted turfgrass sod or turfgrass Landscaping Seed.

RECLAMATION SEED MIXTURE (Non-Irrigated areas)			Broadcast Seeding Rate		
SCIENTIFIC NAME	COMMON NAME	VARIETY	% of mix	Pounds PLS /acre	PLS/ sq. ft.
Elymus trachycaulus	Slender wheatgrass	Pryor	6	2.0	6
Poa secunda (P. ampla)	Big bluegrass	Sherman	20	1.0	20
Pascopyrum smithii	Western wheatgrass	Rosana	21	10.0	21
Bromus marginatus	Mountain Brome	Bromar	19	10.0	19
Deschampsia cespitosa	Tufted hairgrass	Peru Creek or Nortran	28	0.5	28
Monarda fistulosa	Bergamot (Bee balm)	VNS	6	0.2	6
TOTAL			100	23.7	100

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

C. Basis of Payment. Topsoil salvage, replacement, soil conditioning and reseeding are paid for as REVEGATION at the Lump Sum Contract unit price.

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

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

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

(2) Non-discrimination:

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

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

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

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

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

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

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

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

(4) Solicitation for Subcontracts, Including Procurement of Materials and Equipment: In all solicitations, either by competitive bidding, or negotiation, made by the PARTY for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the PARTY of the PARTY's obligation under this contract/agreement and all Acts and Regulations of the United States and the State of Montana related to Non-Discrimination.

(5) Information and Reports: The PARTY will provide all information and reports required by the Acts, Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information and its facilities as may be determined by MDT or relevant US DOT Administration to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the PARTY will so certify to MDT or relevant US DOT Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

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

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

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

(7) Pertinent Non-Discrimination Authorities:

During the performance of this contract/agreement, the PARTY, for itself, its assignees, and successor in interest, agrees to comply with the following non-discrimination statues and authorities; including but not limited to:

Federal

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21;
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *et seq.*), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airways Improvement Act of 1982, (49 U.S.C. § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (broadened the scope, coverage, and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975, and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients, and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibits discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 CFR parts 37 and 38;
- The Federal Aviation Administration's Non-Discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which prevents discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;

- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of Limited English Proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);

- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. § 1681 *et seq.*).

- Executive Order 13672 prohibits discrimination in the civilian federal workforce on the basis of gender identity and in hiring by federal contractors on the basis of both sexual orientation and gender identity.

State

- Mont. Code Ann. § 49-3-205 Governmental services;

- Mont. Code Ann. § 49-3-206 Distribution of governmental funds;

- Mont. Code Ann. § 49-3-207 Nondiscrimination provision in all public contracts.

(8) Incorporation of Provisions: The PARTY will include the provisions of paragraph one through seven in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and/or directives issued pursuant thereto. The PARTY will take action with respect to any subcontract or procurement as MDT or the relevant US DOT Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the PARTY becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the PARTY may request MDT to enter into any litigation to protect the interests of MDT. In addition, the PARTY may request the United States to enter into the litigation to protect the interests of the United States.

DENA MORA REST AREA

IM 90-1(236)5
UPN NUMBER 9432001

ENGINEERING SPECIAL PROVISIONS (VOLUME 2)

VOLUME 2 OF 3

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ENGINEERING SPECIAL PROVISIONS
TABLE OF CONTENTS

DIVISION 2 - SITEWORK

Section	-	Title
02140	-	Dewatering
02730	-	Sanitary Sewer Collection System

DIVISION 26 – Electrical

Section	-	Title
26 05 26	-	Grounding and Bonding
06 05 29	-	Hangers and Support
26 05 33.13		Conduit
26 05 33.16	-	Boxes
26 05 53	-	Electrical Identification
26 05 83	-	Building Wire and Cable
26 27 16	-	Cabinets and Enclosures
26 27 26	-	Wiring Devices
26 51 00	-	Interior Luminaries
26 56 00	-	Exterior Luminaries
26210	-	Electrical Utility Services

DIVISION 33 – UTILITIES

Section	-	Title
33 39 13	-	Sanitary Utility Sewage Manholes, Frames & Covers

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DIVISION 2

SITEWORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Dewatering

1.02 SUBMITTALS

A. Conform with Section 01300 – Submittals

B. Submit a dewatering plan prior to construction showing the proposed method of keeping the construction area as dry as possible as determined by the ENGINEER.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

A. Design, install, test, operate, maintain and monitor dewatering facilities. Collect discharge water from dewatering systems and convey water to discharge points as approved by the ENGINEER.

B. Keep all excavations dry and free from water during construction and the placement of materials.

3.02 DEWATERING

A. Furnish all necessary labor, equipment, pumps and incidentals necessary to dewater the project site during construction.

B. Before excavating to final grade for structures, bring the water level to an acceptable level as determined by the ENGINEER. Maintain this water level until the structures are completed and backfill has been placed around the structures.

C. Control pumping operations so that the groundwater level rises and lowers slowly and uniformly.

D. Groundwater levels may fluctuate due to seasonal conditions.

3.03 PROTECTION

A. Provide sufficient protection at all times to ensure the safety of personnel, equipment, and materials, and the public for activities relating to dewatering and diversion.

3.04 PERMITS

A. CONTRACTOR is responsible for obtaining all permits related to dewatering and discharge of water from dewatering. Including but not limited to Authorization to Discharge under the Montana Pollutant Discharge Elimination System (MPDES).

3.05 DISCHARGE OF WATER

A. Do not allow water resulting from dewatering activities to be discharged or disposed of in such a manner as to damage project or adjacent property.

B. Discharge water in compliance with construction permits and all applicable laws and regulations.

3.06 EXISTING STRUCTURES

A. Conduct dewatering in a manner to avoid damage to existing structures.

B. CONTRACTOR is responsible for repairing all structures damaged as a result of the dewatering.

C. No additional payment will be made to CONTRACTOR for repairing any structures damaged by dewatering and/or diversion.

3.07 CLEANUP

A. Upon completion of project tasks requiring temporary dewatering specified herein, remove all such facilities, grade, and restore all disturbed areas to their original condition, and in accordance with these specifications.

B. No berms, excavations for dewatering, or similar features are allowed to remain at the completion of project.

C. All restoration is subject to approval by the ENGINEER.

PART 4 - MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Measurement and payment will be made as specified in special provisions of the Contract Documents.

END OF SECTION 02140

PART 1 - GENERAL

1.01 DESCRIPTION

A. Furnish and install sewer pipe and fittings including manholes, service lines and other appurtenant structures as specified in the Contract and this section. Pipe strength classifications are shown on the plans, listed in the Contract Documents or specified herein.

1.02 CERTIFICATION BY MANUFACTURER

A. Furnish a manufacturer's certification for all pipe and fittings, certifying that the pipe and fittings meet the contract requirements.

1.03 REFERENCES

ASTM C76	Reinforced Concrete Pipe
ASTM D361	Low Head Pressure RCP
ASTM C443	O-ring Rubber Gaskets
ASTM C478	Precast Reinforced Concrete Manhole Sections
ASTM C655	D-Load RCP
ASTM D1784	Rigid Polyvinyl Chloride Compounds
ASTM D2241	PVC Pressure Pipe
ASTM D3034	Polyvinyl Chloride Sewer Pipe and Fittings
ASTM F679	Large Diameter PVC Pipe
ASTM F714	HDPE Pipe-Dimensions
ASTM 3350	High Density Polyethylene Pipe
ASTM F949	PVC Open Profile Pipe

1.04 STANDARD DRAWINGS:

A. Standard Drawings in Appendix A applicable to this section are as follows:

Standard Drawing No. 02660-2	Water and Sewer Main Separation
Standard Drawing No. 02720-3	Sanitary Sewer and Storm Drain Manhole
Standard Drawing No. 02720-4	Standard Straight Manhole
Standard Drawing No. 02720-5	48" (122 cm) Standard Manholes Showing Two Types of Cone Sections
Standard Drawing No. 02720-6	Pre-Cast Manhole Bases
Standard Drawing No. 02720-7	Typical Manhole Channel Details

Standard Drawing No. 02720-8	Standard Cast Iron Cover
Standard Drawing No. 02720-9	Standard 24” (61 cm) Cast Iron Ring Manhole Frame
Standard Drawing No. 02730-1	Nomograph for Air Testing Gravity Sewer Mains
Standard Drawing No. 02730-2	Sanitary Sewer Service Line
Standard Drawing No. 02730-3	Deep Sanitary Sewer Service Line

PART 2 - PRODUCTS

2.01 GENERAL

A. Furnish sewer pipe and fittings as specified in the Contract Documents and meeting the materials and testing requirements of this Section. Furnish wye or tee branches and service line piping of the same material and design as the sewer pipe unless specified otherwise. Pipe strength classifications are shown on the plans and/or are listed in the Contract Documents.

B. References made to ASTM, ANSI or AASHTO designation are the latest revision at the time of call for bids.

C. Assure all pipe is clearly marked with type, class and/or thickness as applicable. Assure lettering is legible and permanent under normal conditions of handling and storage.

D. Furnish the joint type, class, thickness designation, castings, lining, marking, testing, etc. as specified.

2.02 PIPE MATERIALS

A. Polyvinyl Chloride (PVC) Pipe

1. General

a. Furnish PVC pipe produced by a continuous extrusion process, employing a prime grade of un-plasticized polyvinyl chloride. Assure the grade used is highly resistant to hydrogen sulfide, sulfuric acid, gasoline, oil, detergents and other chemicals found in sewage and industrial wastes. Assure the material meets “Rigid Polyvinyl Chloride Compounds” - ASTM Designation D-1784 requirements. Assure the pipe has self-extinguishing flammability characteristics.

2. Gravity Sewer Pipe

a. Furnish gravity sewer pipe meeting one of the following requirements:

1) ASTM D-3034, “Standard Specifications for Polyvinyl Chloride Sewer Pipe and Fittings”, with an SDR of 35 4"- 15" (10 cm - 38 cm).

2) ASTM F679, “Standard Specifications for PVC Large Diameter Plastic Gravity Sewer Pipe and Fittings” 18"- 36"(46 cm - 76 cm).

3) ASTM F949, "Standard Specification for PVC Corrugated (Open Profile) Sewer Pipe with a Smooth Interior and Fittings" larger than 12" (10cm).

b. Furnish pipe having nominal 12.5 feet (3.8 meters), laying lengths, except shorter lengths may be used adjacent to manholes, lampholes or other appurtenances. Assure each pipe section is marked, as a minimum, with size, SDR, "Sewer Pipe" and Code Number.

3. Pressure Sewer Pipe

a. Furnish pressure sewer pipe meeting ASTM D2241, "Standard Specification for Polyvinyl Chloride Plastic Pipe (SDR-PR), with an SDR of 26 and a pressure rating of 160.

b. Use a nominal laying length of 20 feet (6.1 meters), except shorter lengths may be used adjacent to bends or other appurtenances. Assure each pipe length is marked, as a minimum, with size, SDR, pressure rating or both, ASTM designation and manufacturer's name and code.

4. Pipe Jointing

a. Furnish each pipe length with a bell designed to provide a watertight joint when jointing the bell and spigot with a rubber ring.

b. Make a rubber gasket joint for PVC pipe and fittings using a rubber gasket compressed between the outer surface of the spigot and the inner surface of the bell. Assure the joint is completely sealed by the gasket so that the assembly remains watertight under all service conditions, including expansion, contraction, settlement and pipe deformation. Follow the manufacturer's recommendations when assembling the rubber ring joint.

5. Fittings

a. Assure wye or tee fittings for connecting service lines are of the same material, construction and joint design as the main sewer pipe.

B. Concrete Pipe

1. General

a. Furnish concrete sewer pipe meeting ASTM Specifications C76 or C655, latest revision, except as noted herein. Assure cement used to make concrete pipe is Type II A Modified, Type V or other approved cement containing less than 5 percent Tricalcium Aluminate. The pipe strength classifications for C76 or C655 specification pipe is listed in the plans or Contract Documents.

b. Furnish pipe meeting the referenced ASTM specifications on permissible variations in pipe dimensions. Assure the barrel thickness is uniform to providing a constant flow area without projections across joints.

2. Fittings

a. Use wye or tee fittings for connecting service lines of the same material, construction and joint design as the main sewer pipe.

3. Jointing Material

   a. Make joints for concrete pipe using flexible, watertight, rubber- type gaskets meeting to ASTM C443, with an O-ring gasket confined in the pipe tongue groove.

4. Pipe Jointing

   a. Thoroughly clean the spigot and bell ends of the pipe before joint assembly. Follow the pipe and joint manufacturer's recommendations for pipe jointing. Check the position of the rubber gaskets and pipe assembly using a feeler gauge before backfilling the trench. Visually inspect and gauge pipe and joints from inside the pipe where pipe size permits to assure proper gasket position and joint gap tolerances.

5. Material Testing

   a. When the pipe supplier is not an American Concrete Pipe Association Certified plant, the pipe supplier shall furnish the Engineer with certified test results from an independent testing laboratory on the following: (a) crushing strength (3-edge bearing method), (b) absorption, and (c) hydrostatic test. Furnish test results for each pipe as specified in ASTM C76 or C655, or a minimum two percent of the number of pipe supplied, whichever is greater. Cost of these tests to be borne by the pipe supplier. The engineer retains the option to witness all testing completed at the production facility.

C. High Density Polyethylene (HDPE) Pipe

1. Pipe

   a. Furnish non-profile wall HDPE pipe meeting ASTM D3350, having a cell classification of PE 34-5434C. Assure dimensions and workmanship meet ASTM F714 requirements.

2. Fittings

   a. Use wye or tee fittings for connecting service lines of the same material construction and joint design as the main sewer pipe.

3. Pipe Jointing

   a. Heat fusion weld all field joints to meet the manufacturer's recommendations.

D. Other Pipe Materials

1. Other pipe materials may be specified at the discretion of the Engineer and Owner.

2.03 MANHOLES

A. General

1. Construct manholes from precast concrete sections having frames, covers, and steps meeting Standard Drawings.

B. Precast Concrete Sections

1. Furnish manholes meeting ASTM C478; “Precast Reinforced Concrete Manhole Sections”, specifically including mandatory rejection requirements.

C. Steps

1. Furnish non-corrosive steps, 12-inches (30 cm) in width, of 1/2-inch (13 mm) steel rod encased with polypropylene. Assure steps withstand 400 pound (180 kg) vertical loads and 1,000 pound (450 kg) pull-out resistance.

D. Frames and Covers

1. Furnish frames and covers meeting Standard Drawing Nos.02720-8 and 02720-9. Furnish 2-hole type covers unless specified otherwise.

E. Concrete Base

1. Furnish precast concrete bases or field poured on undisturbed earth. Use concrete meeting Section 03310: STRUCTURAL CONCRETE.

PART 3 - EXECUTION

3.01 PIPE AND SERVICE LINE INSTALLATION

A. Excavation and Backfill

1. Perform pipeline excavation and backfill meeting the applicable requirements of Section 02221: TRENCH EXCAVATION AND BACKFILL FOR PIPELINES AND APPURTENANT STRUCTURES.

B. Responsibility for Materials

1. Be responsible for all material furnished. Replace all material found defective in manufacture or damaged in handling after delivery. This includes furnishing all material and labor required for the replacement of installed material discovered defective before final acceptance of the work or during the guarantee period.

2. Be responsible for the safe storage of material intended for the work until it has been incorporated in the completed project.

C. Handling of Pipe

1. Deliver and distribute all pipe to the site. Load and unload pipe, fittings and accessories by lifting with hoists or skidding to avoid shock or damage. Do not drop any materials. Do not roll or skid pipe handled on skidways against pipe already on the ground.

2. In distributing the material at the site of the work, unload each piece opposite or near the place where it is to be laid in the trench. Keep the interior of all pipe and other accessories free from dirt and foreign matter at all times.

3. Handle pipe to prevent damaging coating or lining. If any part of the coating or lining is damaged, make all repairs in a manner satisfactory to the Engineer.

D. Laying Pipe

1. Lay and maintain all pipe to the specified lines and grades with fittings, tees and manholes at the required locations. Establish line and grade using batter boards and string line, laser equipment or other approved methods. When batter boards and string line are used, use a minimum of three batterboards at all times.
2. Install wye or tee fittings in the mainline sewer for service line connections. Furnish wye or tee fittings of the same material, design and specifications as the sewer main pipe. Joint service pipe to tee branches or main line pipe other than PVC using special joint adapters manufactured specifically for jointing the two types of pipe.
3. Use tools and equipment, satisfactory to the Engineer, for the safe and convenient prosecution of the work. Carefully lower all pipe and fittings into the trench to prevent damage to pipe materials and protective coatings and linings. Do not drop or dump any materials into the trench.
4. Take every precaution to prevent foreign material from entering the pipe while it is being installed. At times when pipe laying is not in progress, close the open ends of pipe using a plug or other means approved by the Engineer. Clean and remove all sand, gravel, concrete and cement grout that has entered the lines during construction.

E. Tolerances

1. Install the pipe within 1/2-inch (13 mm) of the specified alignment and within 1/4-inch (6 mm) of the specified grade.

3.02 MANHOLES

A. Construction

1. Construct manholes to the specified dimensions. Make invert channels smooth and semi-circular in shape conforming to the inside of the adjacent sewer section. Make changes in flow direction with a smooth curve of as large a radius as the manhole size will permit. Make changes in channel grade and size gradually and evenly. The invert channels may be formed directly in the manhole base concrete or by laying half-pipe in the concrete. Make the floor of the manhole outside the channel smooth and slope toward the channel at one inch per foot (8 cm per meter).
2. Joint all connections between manhole walls and base and between wall sections adjusting rings and frame making the manhole watertight. For all horizontal joints located below the established high groundwater elevation, install a preformed rubber gasket joint. The established high groundwater level is shown on the plans or noted in the Special Provisions. For all sewer pipe to manhole joints, use gasketed, flexible, watertight connections that will accommodate differential settlement. Acceptable options for these connections to the manhole are as follows:
    a. Adjacent Joints: Bell and spigot pipe joints with rubber sealing rings located within 12 inches (30 cm) of the manhole wall.
    b. Compression-Type Flexible Connector: A resilient, flexible connection, cast into manhole wall, providing 10 degrees deflection.

c. Boot-Type Flexible Connector: A flexible, watertight connection consisting of a rubber gasket or boot, metal expansion ring and a metal take-up clamp. Assure the expansion ring holds the gasket in the manhole wall, with the take-up clamp holding the gasket to the pipe.

d. Options (b) and (c) are limited to precast manhole base inverts and other installations where the flexibility of the connection is not compromised.

e. Construct manholes meeting ASTM C478, and the rejection criteria stated therein.

f. Keep manhole construction within one manhole distant behind sewer pipeline construction.

3. Install adjusting rings on each manhole to bring the manhole top elevation to match the existing or specified ground elevations. Use manhole rings with a 2-inch minimum (5 cm) and 12-inch (30 cm) maximum height. Furnish adjusting rings reinforced with the same percentage of steel as the riser and top.

3.03 SANITARY SEWER SERVICE LINES

A. Construct service lines meeting Standard Drawing 02730-2. Install the service line to the property line. Plug the end of the service line with a stopper and gasket, using a gasket of the same type used for pipe jointing. Do not grout the plugs.

B. Mark the sanitary sewer and storm drain service line ends at the property line using steel fence post 5 feet (1.5 m) long, buried at least 2 feet (0.6 m). Place a 2" X 2" (5cm X 5 cm) wood marker extending from the pipe invert to ground line. Wire the 2" X 2" (5cm X 5 cm) marker to the steel fence post. Where applicable, mark the concrete curb to identify the service locations. Paint sanitary sewer service markers green and storm drain service markers gray.

3.04 TESTS

A. Make all tests after backfill is completed, but before any surface restoration or street surfacing. Be responsible for finding and repairing all breaks and leaks revealed by the tests. Additionally, perform all tests in the presence of the Engineer, resident inspector, or the Owner's other designated representative.

B. Light Test (Visual)

1. After the trench has been backfilled and compacted as specified in Section 02221, perform a light test between manholes to check alignment and grade for pipe displacement. Excluding curved alignments shown on the plans, the completed pipeline is to permit a true circle of light to be visible from one manhole to the next. If alignment or grade is not that specified and displacement of pipe is found, remedy all defects.

C. Leakage Test

1. New sewer line will not be finally accepted until leakage tests are made assuring the Engineer that pipe laying and jointing are satisfactory.

D. Water Test

1. Where groundwater is at least 2 feet (0.6 m) above the sewer line, make tests by sealing off the section of lines between manholes and measuring the actual flow by collecting or pumping the discharge into barrels or other approved methods. Continue tests at a minimum of 4 hours for each section tested. Allow time to soak lines and manholes in advance of performing tests.
2. When groundwater is not 2 feet (0.6 m) above the pipe, test as follows: On flat slopes where the depth over the centerline of the pipe in the lower manhole of the section being tested will be not more than 10 feet (3 m), fill the upper manhole to 2 feet (0.6 m) over the top of the pipe or 2 feet (0.6 m) above the groundwater elevation (whichever is higher), and block the lower manhole. When the above conditions cannot be met, the Engineer may order testing the line in sections between manholes. Measure the leakage by checking the water level drop in the manhole over a 4-hour period.
3. The allowable infiltration or exfiltration, including manholes, cannot exceed 200 gallons per day per mile of sewer per inch of pipe diameter (185 liters per day per kilometer of sewer per centimeter of pipe diameter). This does not exclude obvious and concentrated leaks and physical defects, such as open joints, pinched gaskets, cracked barrels or bells, etc. Make repairs on concentrated leaks, and as required to reduce infiltration or exfiltration leakage below the specified rate.

E. Air Test (Alternative)

1. As an alternate method to water testing, the Contractor may utilize low pressure air to test the sewer mains. Use the test procedure described below: Plug both ends of the pipe under test with airtight plugs and brace to prevent slippage and blowout. Furnish one plug with an inlet tap or other provision for connecting an air hose.
2. Equip the air supply hose, connected between the air compressor and the plug, with a throttling valve, an air bleed valve and a high-pressure shutoff valve for control. Equip the low-pressure side of the throttling valve with a tee for a monitoring pressure gauge, protected by a gauge cock. This cock is kept closed except when the pressure loss is being timed.
3. If the pipeline is submerged under groundwater, the back pressure, caused by the water head, is measured and added to the standard test pressures to compensate for the groundwater effect on the air test.
4. Apply air slowly to the pipeline until the pressure reaches 4.0 psig (27.6 j). Throttle the air supply to maintain the internal pressure between 4.0 and 3.5 psig (27.6 -24.1 j) for at least 2 minutes. During this time check the plugs with soap solution to detect any plug leakage.
5. When the pressure reaches exactly 3.5 psig (24.1 j), disconnect the air supply, start a stop watch and record the time for the pressure to drop to 2.5 psig (17.2 j). The minimum time allowed for the pressure drop is computed on an air loss rate of 3.5 cfm (5.9m 3 /min) or an air loss rate of 0.0030 cubic feet per minute (cfm) per square foot (0.055 m 3 /min per square meter) of inner pipe surface area under test, whichever rate yields the least time for the pressure drop. Should the time of the

pressure drop between 3.5 and 2.5 psig (24.1 - 17.2 j) be less than the allowable specified time, make the necessary leakage repairs and repeat the air test.

6. Standard Drawing 02730-1 provides a nomograph which may be used to compute testing times for air testing. The nomograph computes results based upon English (U.S. Customary) units.

7. For single pipe size test sections, the length limits for minimum test times obtained from Standard Drawing No.02730-1 entitled "Nomograph for Air Testing Gravity Sewer Mains" are contained in the following table.

TABLE 3.1

LENGTH LIMIT FOR MINIMUM TEST TIMES

Pipe Diameter, Inches (cm)	Test Section Length, Foot (m)	
	Minimum	Maximum
4 (10)	642(196)	1124 (343)
6 (15)	429(131)	751 (229)
8 (20)	322(98)	564 (172)
10 (25)	257(78)	450 (137)
12 (30)	215(66)	376 (115)
15 (38)	172(52)	300 (91)
18 (46)	43(44)	1250 (76)
21 (53)	123(37)	215 (66)
24 (61)	107(33)	188 (57)

8. For test sections that are shorter than the minimum lengths, new test times must be calculated. This is done by multiplying the test time from the nomograph by the actual length of the test section (in feet) and then dividing the resultant product by the minimum test section length from the preceding table.

9. For test sections exceeding the maximum lengths, either shorten the test section to an allowable length or use the water test.

F. Number of Tests

1. Perform the number of leakage tests directed by the Engineer to assure that materials and workmanship are acceptable. Repair defective joints using only approved methods. Replace pipe having cracked or broken barrels. Do not exceed 800 feet (240 m) of sewer line per test unless otherwise approved.

G. T.V. Inspection

1. All sewer mains shall be inspected using a television camera before final acceptance. A sewer line is deficient and unacceptable if (1) the alignment is outside the specified limits, (2) water ponds in any section are equal to or greater than 2 times the grade tolerance specified herein under Section 02730.3.E.1, or (3) the pipe has visible defects such as open joints, pinched gaskets, cracked barrels or bell, or similar defects.

2. Pay all costs incurred in any television inspection performed solely for Contractor benefit.

3. Record all television inspections in a format acceptable to the Owner. Pull the camera through the sewer at 30 feet per minute (9 meters per minute maximum). If the camera is pulled by attaching to the hose of a hydraulic sewer cleaner, assure the hose is not active during the pulling process.

H. Deflection Testing

1. The Engineer may require deflection testing of all or any portion of a flexible pipe installation to assure the construction quality. Flexible pipe is pipe that will deflect at least 2 percent without any sign of structural distress.

2. Conduct deflection tests, when performed on PVC pipe, meeting ASTM D3034 and satisfy either of the following deflection limitations:

TABLE 3.2
DEFLECTION TESTING LIMITATIONS

Minimum Period Between Trench Backfilling & Testing	Minimum Mandrel Diameter as a Percent of Inside Pipe Diameter
7 Days	95.0
30 Days	92.5

3. Mandrels must have at least nine arms. Perform the mandrel test without mechanical pulling devices.

I. Material and Equipment for Testing

1. Furnish all labor, equipment and materials (including water) necessary for performing the sewer line tests at Contractor expense.

3.05 WATER AND SEWER MAIN SEPARATION

A. Horizontal and vertical separation between water and sewer mains is dictated by Montana Department of Environmental Quality.

PART 4 - MEASUREMENT AND PAYMENT

4.01 GENERAL

A. The following items are the pay items for the work covered under this section. Payment for these items is full compensation for providing all materials, tools, labor and equipment necessary to complete the item and all incidental work related thereto, whether specifically mentioned herein or not.

4.02 SEWER MAINS

A. Measurement of sewer mains are made in lineal feet (meters) of the various sizes and classes along the centerline of pipe from center to center of manholes. Payment for sewer main is made at the contract unit price bid per lineal foot (meters) of the various sizes and classes called for, which includes furnishing and installing pipe, trench excavation and backfill, furnishing and placing Type 1 pipe bedding, specials required

for connection to manholes, testing and all other work necessary or incidental for completion of the item.

4.03 MANHOLES

A. Measurement of each manhole for payment is made in two parts: (1) for a basic manhole, and (2) for any additional vertical height over and above the basic depth. A basic manhole is defined as being 5 feet deep (1.5 m) from the lowest invert to the top of the manhole frame and cover. Any manhole less than 5 feet deep (1.5 m) is considered as one basic manhole.

B. Any manhole over 5 feet deep (1.5 m) is considered as one basic manhole plus a vertical height measurement to the nearest 0.1 foot (0.03 m). Basic manholes are measured by numerical count and the additional vertical heights feet (meters) of manhole. The measurement of the additional vertical height of manhole is the vertical height of the manhole from the lowest invert to the top of the cast iron frame minus 5 feet (1.5 m).

C. Payment for furnishing and installing a basic manhole, complete in-place, is made at the contract unit price bid per each for “Basic Manholes”, 5.0 feet deep. Such payment includes base, manhole sections, steps, cast iron ring and cover, joint sealer and all other incidentals required to complete the item.

D. Payment for furnishing and installing manholes deeper than the basic manhole depth is made at the contract unit price bid per vertical foot (meter) for “Additional Manhole Depth” and includes manhole sections, steps, joint sealer and all other incidentals to complete the item.

E. Payment is made under:

1. Basic Manhole, 5'-0" (1.5 meter) Depth - Per Each.
2. Additional Manhole Depth - Per Vertical Foot (meter).

4.04 SANITARY SEWER SERVICE LINES

A. Measurement is made along the pipe from the tee or wye of the main sewer through tees, wyes and other fittings to the street margin or right-of-way margin. Measurement is to the nearest foot (0.3m).

1. Payment for services is based on the following bid items as specified in the contract:

a. Trench excavation and backfill is included in the linear foot price bid for sewer service pipe.

b. (size) (class) Sewer Service Pipe in Place,” per linear foot.

4.05 GENERAL

A. The contract bid prices are full payment for all labor, materials, tools and other incidentals as maybe required to complete the items of work in the Contract.

END OF SECTION 02730

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DIVISION 26

ELECTRICAL

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PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Grounding and bonding components.

B. Provide all components necessary to complete the grounding system(s) consisting of:

1. Dose tank piping.
2. Building.
3. Concrete-encased electrode (copper).
4. Rod electrodes.

1.02 REFERENCE STANDARDS

A. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association; 2007.

B. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.

1.03 SUBMITTALS

A. Product Data: Provide for grounding electrodes and connections.

B. Test Reports: Indicate overall resistance to ground and resistance of each electrode.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Cooper Power Systems: www.cooperpower.com.

B. Framatome Connectors International: www.fciconnect.com.

C. Lightning Master Corporation: www.lightningmaster.com.

D. Or approved equal.

2.02 ELECTRODES

A. Manufacturers:

1. Cooper Power Systems: www.cooperpower.com.
2. Framatome Connectors International: www.fciconnect.com.
3. Lightning Master Corporation: www.lightningmaster.com.

B. Rod Electrodes: Copper.

1. Diameter: 3/4 inch.

2. Length: 8 feet.

C. Ground to copper concrete encased, # 4 AWG CU or larger with approved connector.

2.03 CONNECTORS AND ACCESSORIES

A. Mechanical Connectors: Bronze.

B. Exothermic Connections:

C. Wire: Stranded copper.

D. Grounding Electrode Conductor: Size to meet NFPA 70 requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

B. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.02 INSTALLATION

A. Install ground electrodes at locations indicated. Install additional rod electrodes as required to achieve specified resistance to ground.

B. Install 4 AWG bare copper wire in foundation footing.

C. Bond building grounding electrode system to lightning protection system.

D. Provide bonding to meet requirements described in Quality Assurance.

PART 4 - MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Measurement and payment will be made as specified in Section 01150 of the Contract Documents.

END OF SECTION 26 05 26

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Conduit and equipment supports.

B. Anchors and fasteners.

1.02 SUBMITTALS

A. Product Data: Provide manufacturer's catalog data for fastening systems.

1.03 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Thomas & Betts Corporation: www.tnb.com.

B. Threaded Rod Company: www.threadedrod.com.

C. Or approved equal.

2.02 MATERIALS

A. Hangers, Supports, Anchors, and Fasteners - General: Corrosion-resistant materials of size and type adequate to carry the loads of equipment and conduit, including weight of wire in conduit.

B. Supports: Fabricated of structural steel or formed steel members; galvanized.

C. Anchors and Fasteners:

1. Concrete Structural Elements: Use precast inserts, expansion anchors, or preset inserts.
2. Steel Structural Elements: Use beam clamps, steel spring clips, or steel ramset fasteners.
3. Concrete Surfaces: Use self-drilling anchors or expansion anchors.
4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts or hollow wall fasteners.
5. Solid Masonry Walls: Use expansion anchors or preset inserts.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install hangers and supports as required to adequately and securely support electrical system components, in a neat and workmanlike manner, as specified in NECA 1.

1. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
2. Obtain permission from Structural Engineer before drilling or cutting structural members.

B. Use hexagon-head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.

C. Install surface-mounted cabinets and panelboards with minimum of four anchors.

D. In wet and damp locations use steel channel supports to stand cabinets and panelboards 1 inch off wall.

E. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

PART 4 - MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Measurement and payment will be made as specified in Section 01150 of the Contract Documents.

END OF SECTION 26 05 29

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Conduit, fittings and conduit bodies.

1.02 RELATED REQUIREMENTS

A. Section 26060 - Grounding and Bonding.

B. Section 26070 - Hangers and Supports.

C. Section 26075 - Electrical Identification.

D. Section 26138 - Boxes.

1.03 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2005.

B. ANSI C80.3 - American National Standard for Steel Electrical Metallic Tubing (EMT); 2005.

C. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association; 2006.

D. NECA 101 - Standard for Installing Steel Conduit (Rigid, IMC, EMT); National Electrical Contractors Association; 2006.

E. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; National Electrical Manufacturers Association; 2007.

F. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit; National Electrical Manufacturers Association; 2003.

G. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing; National Electrical Manufacturers Association; 2004.

H. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.

1.04 SUBMITTALS

A. Product Data: Provide for metallic conduit, flexible metal conduit, liquidtight flexible metal conduit, metallic tubing, nonmetallic conduit, and fittings.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for purpose specified and shown.

PART 2 - PRODUCTS

2.01 CONDUIT REQUIREMENTS

A. METAL CONDUIT

1. Manufacturers:
   a. Allied Tube & Conduit: www.alliedtube.com.
   b. Beck Manufacturing, Inc.: www.beckmfg.com.
   c. Wheatland Tube Company: www.wheatland.com.
   d. Or approved equal.
2. Rigid Steel Conduit: ANSI C80.1.
3. Intermediate Metal Conduit (IMC): Rigid steel.
4. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit.

B. FLEXIBLE METAL CONDUIT

1. Manufacturers:
   a. AFC Cable Systems, Inc.: www.afcweb.com.
   b. Electri-Flex Company: www.electriflex.com.
   c. International Metal Hose: www.metalhose.com.
   d. Or approved equal.

C. LIQUIDTIGHT FLEXIBLE METAL CONDUIT

1. Manufacturers:
   a. AFC Cable Systems, Inc.: www.afcweb.com.
   b. Electri-Flex Company: www.electriflex.com.
   c. International Metal Hose: www.metalhose.com.
   d. Or approved equal.

D. ELECTRICAL METALLIC TUBING (EMT)

1. Manufacturers:
   a. Allied Tube & Conduit: www.alliedtube.com.
   b. Beck Manufacturing, Inc.: www.beckmfg.com.
   c. Wheatland Tube Company: www.wheatland.com.
   d. Or approved equal.
2. Description: ANSI C80.3; galvanized tubing.
3. Fittings and Conduit Bodies: NEMA FB 1; steel set screw type.

E. NONMETALLIC CONDUIT

1. Manufacturers:
   a. AFC Cable Systems, Inc.: www.afcweb.com.
   b. Electri-Flex Company: www.electriflex.com.
   c. International Metal Hose: www.metalhose.com.
   d. Or approved equal.
2. Description: NEMA TC 2; Schedule 40 PVC below ground Schedule 80 above ground.
3. Fittings and Conduit Bodies: NEMA TC 3.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as shown on drawings.

B. Verify routing and termination locations of conduit prior to rough-in.

3.02 INSTALLATION

A. Install conduit in accordance with the manufacturer's recommendations.

3.03 INTERFACE WITH OTHER PRODUCTS

A. Install conduit to preserve fire resistance rating of partitions and other elements.

B. Route conduit through roof openings for piping and ductwork wherever possible. Where separate roofing penetration is required, coordinate location and installation method with roofing installation.

PART 4 - MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Measurement and payment will be made as specified in Section 01150 of the Contract Documents.

END OF SECTION 26 05 33.13

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PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Wall and ceiling outlet boxes.

B. Floor boxes.

C. Pull and junction boxes.

1.02 RELATED REQUIREMENTS

A. Section 26139 - Cabinets and Enclosures.

B. Section 26140 - Wiring Devices: Wall plates in finished areas.

1.03 REFERENCE STANDARDS

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association; 2006.

B. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; National Electrical Manufacturers Association; 2008.

C. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Provide products listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.01 OUTLET BOXES

A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.

1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 1/2 inch male fixture studs where required.

2.02 PULL AND JUNCTION BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

B. Hinged Enclosures: As specified in Section 16139.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify locations of floor boxes and outlets in offices and work areas prior to rough-in.

3.02 INSTALLATION

A. Install boxes securely, in a neat and workmanlike manner, as specified in NECA 1.

B. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and as required by NFPA 70.

C. Electrical boxes are shown on Drawings in approximate locations unless dimensioned.

D. Orient boxes to accommodate wiring devices oriented as specified in Section 16140.

E. Maintain headroom and present neat mechanical appearance.

F. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

G. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.

H. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07840.

I. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.

J. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

K. Use flush mounting outlet box in finished areas with open framing members.

L. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

M. Do not fasten boxes to ceiling support wires.

N. Support boxes independently of conduit, except cast box that is connected to two rigid metal conduits both supported within 12 inches of box.

O. Use gang box and plaster ring where more than one device is mounted together.

P. Use gang box with plaster ring for single device outlets.

3.03 ADJUSTING

A. Adjust flush-mounting outlets to make front flush with finished wall material.

B. Install knockout closures in unused box openings.

3.04 CLEANING

A. Clean interior of boxes to remove dust, debris, and other material.

B. Clean exposed surfaces and restore finish.

PART 4 - MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Measurement and payment will be made as specified in Section 01150 of the Contract Documents.

END OF SECTION 26 05 33.16

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PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Nameplates and labels.

B. Wire and cable markers.

C. Conduit markers.

1.02 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.

1.03 SUBMITTALS

A. Product Data: Provide catalog data for nameplates, labels, and markers.

B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Quality Assurance. Include instructions for storage, handling, protection, examination, preparation and installation of product.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Brady Corporation: www.bradycorp.com.

B. Seton Identification Products: www.seton.com/aec.

C. HellermannTyton: www.hellermanntyton.com.

2.02 NAMEPLATES AND LABELS

A. Nameplates: **Engraved** three-layer laminated plastic, white letters on black background.

B. Locations:

1. Each electrical distribution and control equipment enclosure.

C. Letter Size:

1. Use 1/4 inch letters for identifying grouped equipment and loads.

2.03 WIRE MARKERS

A. Description: Vinyl cloth type self-adhesive wire markers.

B. Locations: Each conductor at panelboard gutters, pull boxes, outlet boxes, and junction boxes each load connection.

C. Legend:

1. Power and Lighting Circuits: Branch circuit or feeder number indicated on drawings.
2. Control Circuits: Control wire number indicated on schematic and interconnection diagrams on drawings.

PART 3 - EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive nameplates and labels.

PART 4 - MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Measurement and payment will be made as specified in Section 01150 of the Contract Documents.

END OF SECTION 26 05 53

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Wire and cable for 600 volts and less.

B. Wiring connectors and connections.

1.02 RELATED REQUIREMENTS

A. Section 26075 - Electrical Identification.

1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Contracting; National Electrical Contractors Association; 2006.

B. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association; 2009.

C. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.

1.04 SUBMITTALS

A. Project Record Documents: Record actual locations of components and circuits.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

PART 2 - PRODUCTS

2.01 WIRING REQUIREMENTS

A. Concealed Dry Interior Locations: Use only building wire in raceway, building wire with Type THHN insulation in raceway, armored cable, or metal clad cable.

B. Exposed Dry Interior Locations: Use only building wire in raceway, building wire with Type THHN insulation in raceway, armored cable, or metal clad cable.

C. Above Accessible Ceilings: Use only building wire in raceway, building wire with Type THHN insulation in raceway, armored cable, or metal clad cable.

D. Wet or Damp Interior Locations: Use only building wire in raceway, building wire with Type THWN insulation in raceway, or flexible liquid tight electrical conduit.

E. Exterior Locations: Use only building wire in raceway, building wire with Type THWN insulation in raceway, or flexible liquid tight electrical conduit.

F. Underground Installations: Use only building wire with Type THWN insulation in raceway.

G. Use stranded conductors for control circuits.

H. Use conductor not smaller than 12 AWG for power and lighting circuits.

I. Use conductor not smaller than 16 AWG for control circuits.

J. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet, or as required by the NFPA 70.

2.02 WIRE MANUFACTURERS

A. Cerro Wire Inc.: www.cerrowire.com.

B. Industrial Wire & Cable, Inc.: www.iewc.com.

C. Southwire Company: www.southwire.com.

D. Or approved equal.

2.03 BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor: Copper.

1. For Sizes Smaller Than 4 AWG: Copper.
2. For Sizes 4 AWG and Larger: Copper.

C. Insulation Voltage Rating: 600 volts.

D. Insulation: NFPA 70, Type THHN/THWN.

2.04 ARMORED CABLE

A. Description: NFPA 70, Type AC.

B. Conductor: Copper.

1. For Sizes Smaller Than 4 AWG: Copper.
2. For Sizes 4 AWG Through 1 AWG: Copper.

C. Insulation Voltage Rating: 600 volts.

D. Insulation Temperature Rating: 60 degrees C.

E. Insulation Material: Thermoplastic.

2.05 METAL CLAD CABLE

A. Description: NFPA 70, Type MC.

B. Conductor: Copper.

1. For Sizes Smaller Than 4 AWG: Copper.
2. For Sizes 4 AWG and Larger: Copper.

C. Insulation Voltage Rating: 600 volts.

D. Insulation Temperature Rating: 60 degrees C.

E. Insulation Material: Thermoplastic.

F. Armor Material: Steel.

G. Armor Design: Interlocked metal tape.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that mechanical work likely to damage wire and cable has been completed.

C. Verify that raceway installation is complete and supported.

D. Verify that field measurements are as indicated.

3.02 INSTALLATION

A. Install wire and cable securely, in a neat and workmanlike manner, as specified in NECA 1.

B. Route wire and cable as required to meet project conditions.

1. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.

C. Use wiring methods indicated.

D. Pull all conductors into raceway at same time.

E. Use suitable wire pulling lubricant for building wire 4 AWG and larger.

F. Protect exposed cable from damage.

G. Support cables above accessible ceiling, using spring metal clips or metal or plastic cable ties to support cables from structure or ceiling suspension system. Do not rest cable on ceiling panels.

H. Use suitable cable fittings and connectors.

I. Neatly train and lace wiring inside boxes, equipment, and panelboards.

J. Clean conductor surfaces before installing lugs and connectors.

K. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.

L. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

M. Identify and color code wire and cable under provisions of Section 16075. Identify each conductor with its circuit number or other designation indicated.

PART 4 - MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Measurement and payment will be made as specified in Section 01150 of the Contract Documents.

END OF SECTION 26 05 83

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Hinged cover enclosures.

B. Cabinets.

C. Terminal blocks.

D. Accessories.

1.02 REFERENCE STANDARDS

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association; 2006.

B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association; 2008.

C. NEMA ICS 4 - Industrial Control and Systems: Terminal Blocks; National Electrical Manufacturers Association; 2005.

D. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.

1.03 SUBMITTALS

A. Product Data: Provide manufacturer's standard data for enclosures and cabinets.

B. Cabinet Keys: Deliver to Owner in accordance with Section 01700 for Contract Closeout.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

PART 2 - PRODUCTS

2.01 HINGED COVER ENCLOSURES

A. Construction: NEMA 250, Type 1 steel enclosure.

B. Covers: Continuous hinge, held closed by operable by screwdriver.

C. Enclosure Finish: Manufacturer's standard enamel.

2.02 CABINETS

A. Boxes: Galvanized steel.

B. Fronts: Steel, flush type with concealed trim clamps, door with concealed hinge, and flush lock keyed to match branch circuit panelboard. Finish with gray baked enamel.

C. Provide metal barriers to form separate compartments wiring of different systems and voltages.

D. Keys: Provide two of each different key.

2.03 TERMINAL BLOCKS

A. Terminal Blocks: NEMA ICS 4.

B. Power Terminals: Unit construction type with closed back and tubular pressure screw connectors, rated 600 volts.

C. Signal and Control Terminals: Modular construction type, suitable for channel mounting, with tubular pressure screw connectors, rated 300 volts.

D. Provide ground bus terminal block, with each connector bonded to enclosure.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install securely, in a neat and workmanlike manner, as specified in NECA 1.

B. Install enclosures and boxes plumb. Anchor securely to wall and structural supports at each corner under the provisions of Section 16070.

C. Install cabinet fronts plumb.

3.02 CLEANING

A. Clean electrical parts to remove conductive and harmful materials.

B. Remove dirt and debris from enclosure.

C. Clean finishes and touch up damage.

PART 4 - MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Measurement and payment will be made as specified in Section 01150 of the Contract Documents.

END OF SECTION 26 27 16

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Wall switches

B. Wall dimmers

C. Receptacles

D. Wall plates

E. Floor box service fittings

F. Poke-through assemblies.

1.02 RELATED REQUIREMENTS

A. Section 26138 - Boxes

1.03 REFERENCE STANDARDS

A. FS W-C-596 - Connector, Electrical, Power, General Specification for; Federal Specification; Revision G, 2001.

B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification); Federal Specification; Revision F, 1999.

C. NECA 1 - Standard for Good Workmanship in Electrical Contracting; National Electrical Contractors Association; 2006.

D. NEMA WD 1 - General Color Requirements for Wiring Devices; National Electrical Manufacturers Association; 1999 (R 2005).

E. NEMA WD 6 - Wiring Device -- Dimensional Requirements; National Electrical Manufacturers Association; 2002 (R2008).

F. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.

G. UL 20 - General-Use Snap Switches; Current Edition, Including All Revisions.

H. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.

I. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Cooper Wiring Devices: www.cooperwiringdevices.com.

B. GE Industrial: www.geindustrial.com.

C. Leviton Manufacturing, Inc.: www.leviton.com.

D. Pass Seymour: www.passandseymour.com.

E. Or approved equal.

2.02 ALL WIRING DEVICES

A. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

2.03 WALL SWITCHES

A. All Wall Switches: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.

1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.

B. Occupancy sensors:

1. Ratings:

a. Voltage: 120-208 volts, AC.

b. Current: 20 amperes. Industrial grade light switches. (Leviton 1221-2 or equal)

2. Ratings: Match branch circuit and load characteristics.

3. Use Watt Stopper or approved equal.

2.04 RECEPTACLES

A. All Receptacles: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.

1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.

2. NEMA configurations specified are according to NEMA WD 6.

B. GFCI Receptacles: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements. Commercial grade 20 amp duplex with LED indicator light. (Leviton 8898 or equal)

2.05 WALL PLATES

A. All Wall Plates: Comply with UL 514D.

1. Configuration: One-piece cover as required for quantity and types of corresponding wiring devices.

2. Size: Standard.

3. Screws: Metal with slotted heads finished to match wall plate finish.

B. Cover Plates: Stainless steel cover plates.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as shown on the drawings.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.

C. Verify that wall openings are neatly cut and will be completely covered by wall plates.

D. Verify that final surface finishes are complete, including painting.

E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

F. Verify that conditions are satisfactory for installation prior to starting work.

G. Verify that all outlets, switches, plates and etc. match the project color scheme.

3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

A. Perform work in a neat and workmanlike manner in accordance with NECA 1, including mounting heights specified in that standard unless otherwise indicated.

B. Coordinate locations of outlet boxes provided under Section 16138 as required for installation of wiring devices provided under this section.

C. Install wiring devices in accordance with manufacturer's instructions.

D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.

F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.

G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

H. Install securely, in a neat and workmanlike manner, as specified in NECA 1.

I. Install wiring devices plumb and level with mounting yoke held rigidly in place.

J. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.

K. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.

L. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

M. Install receptacles with grounding pole on bottom.

N. Connect wiring device grounding terminal to outlet box with bonding jumper.

O. Connect wiring devices by wrapping conductor around screw terminal.

P. Ground all light switches.

3.04 FIELD QUALITY CONTROL

A. Inspect each wiring device for damage and defects.

B. Operate each wall switch, wall dimmer, and fan speed controller with circuit energized to verify proper operation.

C. Operate each wall switch with circuit energized and verify proper operation.

D. Verify that each receptacle device is energized.

E. Test each receptacle to verify operation and proper polarity.

F. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.

G. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.05 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

3.06 CLEANING

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

PART 4 - MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Measurement and payment will be made as specified in Section 01150 of the Contract Documents.

END OF SECTION 26 27 26

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Interior lighting fixtures and accessories.

B. Lamps.

1.02 REFERENCE STANDARDS

A. NECA/IESNA 500 - Standard for Installing Indoor Commercial Lighting Systems; National Electrical Contractors Association; 2006.

B. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.

C. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures; National Fire Protection Association; 2009.

1.03 SUBMITTALS

A. Product Data: Provide dimensions, ratings, and performance data.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70 and NFPA 101.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Lithonia Lighting: www.lithonia.com.

B. Day-Brite.

C. Or approved equal.

2.02 GENERAL REQUIREMENTS FOR INTERIOR LIGHTING FIXTURES

A. Provide products that comply with requirements of NFPA 70 and NFPA 101.

B. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

2.03 LUMINAIRES

A. Furnish products as indicated in Schedule included on the Drawings.

2.04 LAMPS

A. Lamp Types: As specified for each fixture.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install fixtures securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting).

B. Surface Mounted Fixtures: Install plumb and square and aligned with building lines and with each other; secure to prevent movement.

C. Install accessories furnished with each fixture.

D. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within fixture; use flexible conduit.

E. Connect luminaires and exit signs to branch circuit outlets using flexible conduit. All conduit must be concealed in wall, unless approved in writing by ENGINEER and OWNER.

F. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

G. Bond products and metal accessories to branch circuit equipment grounding conductor.

H. Install specified lamps in each luminaire.

3.02 FIELD QUALITY CONTROL

A. Operate each fixture after installation and connection. Inspect for proper connection and operation.

3.03 ADJUSTING

A. Aim and adjust fixtures as directed.

3.04 CLEANING

A. Clean electrical parts to remove conductive and deleterious materials.

B. Remove dirt and debris from enclosures.

C. Clean finishes and touch up damage.

3.05 CLOSEOUT ACTIVITES

A. Relamp luminaires that have failed lamps at Substantial Completion.

B. Provide one-year warranty for all new fixtures supplied.

3.06 SCHEDULE - SEE DRAWINGS

PART 4 - MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Measurement and payment will be made as specified in Section 01150 of the Contract Documents.

END OF SECTION 26 51 00

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Exterior luminaires and accessories.

1.02 REFERENCE STANDARDS

A. NECA/IESNA 50 - Recommended Practice for Installing Exterior Lighting Systems; 2006.

B. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.

1.03 SUBMITTALS

A. Product Data: Provide dimensions, ratings, and performance data.

B. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

C. Maintenance Data: For each luminaire.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Electrical Components: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. American Scientific Lighting Corporation: www.asllighting.com.

B. GE Lighting: www.gelighting.com.

C. Thomas & Betts Corporation: www.tnb.com .

D. Approved equal or as indicated on Schedule.

2.02 LUMINAIRES

A. Furnish products as indicated in the electrical drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install fixtures securely, in a neat and workmanlike manner, as specified in NECA 501.

B. Seal all gaps around fixtures to prevent intrusion of weather and dust.

C. Install lamps in each luminaire.

D. Bond luminaires and metal accessories to branch circuit equipment grounding conductor.

3.02 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for improper connections and operation.

3.03 ADJUSTING

A. Aim and adjust luminaires to provide illumination levels and distribution as directed.

3.04 CLEANING

A. Clean electrical parts to remove conductive and deleterious materials.

B. Remove dirt and debris from enclosure.

C. Clean photometric control surfaces as recommended by manufacturer.

D. Clean finishes and touch up damage.

PART 4 - MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Measurement and payment will be made as specified in Section 01150 of the Contract Documents.

END OF SECTION 26 56 00

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Metering transformer cabinets.

B. Meter bases.

1.02 REFERENCE STANDARDS

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting National Electrical Contractors Association; 2006.

B. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.

1.03 SYSTEM DESCRIPTION

A. System Characteristics: 120/240 volts, three phase, open delta four-wire, 60 Hertz.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation Meeting: Convene one week prior to commencing work of this section. Review service entrance requirements and details with Utility Company representative.

B. Verify with Utility Co. that equipment to be relocated meets current standards.

1.05 SUBMITTALS

A. Product Data: Provide ratings and dimensions of transformer cabinets and meter bases.

1.06 QUALITY ASSURANCE

A. Northwestern Energy

B. Perform work in accordance with utility company written requirements and NFPA 70.

C. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. GE Industrial: www.geindustrial.com.

B. Milbank Manufacturing: www.milbankmfg.com.

C. Square D: www.squared.com.

D. Or approved equal

2.02 COMPONENTS

A. Metering Transformer Cabinets: Sheet metal cabinet with hinged door, conforming to utility company requirements, with provisions for locking and sealing.

PART 3 - EXECUTION

3.01 PREPARATION

A. Arrange with utility company to obtain permanent electric service to the Project.

3.02 INSTALLATION

A. Install meter base as required by utility company.

B. Install securely, in a neat and workmanlike manner, as specified in NECA 1.

PART 4 - MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Measurement and payment will be made as specified in Section 01150 of the Contract Documents.

END OF SECTION 26210

DIVISION 33

UTILITIES

PART 1 - GENERAL

1.01 GENERAL

The Work in this section includes furnishing and installing wastewater structures (manholes & structures) components and coatings for rehabilitation, structural enhancement, and corrosion protection of existing wastewater manholes, for the various sizes shown in the project plans. Wastewater access structures include, but are not limited to, manholes, vaults, junctions, and wet wells.

The Contractor shall furnish all materials, labor, equipment, and services necessary for wastewater manhole component repair and coating installation including: traffic control, pump around pumping and/or diversion of wastewater flows, void repair, inflow/infiltration elimination, surface preparation, structure component and coating installation, testing, surface restoration, and cleanup of the Work site.

1.02 GOVERNING STANDARDS

The following Standards are referenced in this section:

ASTM	C109	"Standard Test Method for Compressive Strength of Hydraulic Cement Mortars"
ASTM	C157	"Standard Test Method for Length Change of Hardened Hydraulic-Cement, Mortar, and Concrete"
ASTM	C293	"Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Center-Point Loading)"
ASTM	C307	"Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing"
ASTM	C308 Modified	"Standard Test Method for Working, Initial Setting, and Service Strength Setting Times of Chemical-Resistant Resin Mortars"
ASTM	C309	"Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete"
ASTM	C321	"Standard Test Method for Bond Strength of Chemical-Resistant Mortars"
ASTM	C496	"Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens"

ASTM	C531	“Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes”
ASTM	C579	“Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing and Polymer Concretes”
ASTM	C596	“Standard Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement”
ASTM	C580	“Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes”
ASTM	C666	“Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing”
ASTM	C882	“Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear”
ASTM	C905	“Standard Test Methods for Apparent Density of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes”
ASTM	D543	"Resistance of Plastics to Chemical Reagents"
ASTM	D638	"Tensile Properties of Plastics"
ASTM	D695	"Compressive Properties of Rigid Plastics"
ASTM	D790	"Flexural Properties of Unreinforced and Reinforced Plastics"
ASTM	D1622	“Standard Test Method for Apparent Density of Rigid Cellular Plastics”
ASTM	D1623	“Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics”
ASTM	D2126	“Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging”
ASTM	D2584	"Volatile Matter Content"
ASTM	D2842	“Standard Test Method for Water Absorption of Rigid Cellular Plastics”
ASTM	D3846	“Standard Test Method for In-Plane Shear Strength of Reinforced Plastics”
ASTM	D4258	“Standard Practice for Surface Cleaning Concrete for Coating”
ASTM	D4259	“Standard Practice for Abrading Concrete”

ASTM	D4541	"Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers"
ASTM	D4787	"Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates"
ACI	503	"Use of Epoxy Compounds with Concrete"
SSPC/ NACE	SP-13/ NACE 6	"Surface Preparation of Concrete"

1.03 DEFINITIONS

A. **Coating Systems:** includes surface description, surface preparation, required dry film thickness, and the number and application procedure of the prime and finish coatings. Systems are defined and identified in the article headed "Coating System Specification Sheets" in this Section of the Technical Specifications.

B. **Field Coating:** the application of the coating system in an existing manhole or structure.

C. **Dry Film Thickness (DFT):** the thickness of a fully cured coating or coating system.

D. **Wet Film Thickness (WFT):** the thickness of a coating while wet.

E. **Volatile Organic Content (VOC):** the portion of a coating that is a compound of carbon, is photo chemically reactive, and evaporates during drying or curing, expressed in g/L or lbs/gal as defined in ASTM D3960.

F. **Solvents:** Those chemicals used to dilute the liquid coating either for thinning the coating or for cleanup.

G. **Lead Containing:** any coating that contains any detectable amount of lead.

H. **Hard To Reach:** areas that may not be accessible with spray equipment but can be reached by brush, mitt, or roller.

I. **Inaccessible Areas:** areas such as back-to-back angles, skip welds, and other areas that a brush, mitt, or roller cannot contact the surface.

J. **Manhole Floor:** the bench, channel and invert of the manhole containing the concrete floor of a manhole generally shaped as a fillet to direct incoming flows to the outlet piping and to minimize solids buildup, the wall/bench joint, the shaped flow-ways within the bench, the bench/channel joint, and the invert which is the line of the lowest elevation along the bottom of the channel(s).

K. **Manhole Wall:** that part of the manhole extending from the bench/wall joint to the bottom of the cone/corbel.

L. **Manhole Cone/Corbel:** the reducing section which tapers concentrically or eccentrically from the top wall joint to the bottom of the chimney or the ring (frame) casting where there is no chimney.

M. **Manhole Chimney:** the narrow vertical section built from concrete adjusting rings extending from the top of the cone/corbel to the bottom of the frame casting.

N. **Leaks/Infiltration:** presence of water, or indications of water, inside the manhole or structure caused by subsurface water entering the manhole or structure from the exterior through cracks, fractures, holes, broken seals, or other means.

O. **Inflow:** surface water generally entering into a manhole or structure through or under the manhole or structure cover, frame, frame seal, chimney wall, or at the cone/corbel chimney joint.

P. **Void:** as defined in ACI.

Q. **pH:** a measure of acidity and alkalinity.

R. **Bug Holes:** small regular or irregular cavities, not exceeding 15mm in diameter, resulting from the entrapment of air bubbles of formed concrete during placement and compaction.

1.04 QUALIFICATIONS

A. The Contractor shall be certified and/or licensed by the coating system, and chimney sealant, manufacturer(s) as an approved Applicator for the products referenced in this section.

B. The Applicator shall be the person responsible for the actual Work, either as the foreman or the person actually applying the coating system.

1.05 SUBMITTALS

The Contractor shall submit the following to the Engineer in accordance with the *General Conditions* article headed "Shop Drawings and Submittals":

A. List of materials including coatings, repair materials, and blasting abrasive material proposed for use.

B. List of equipment and certification by the individual coating manufacturer that the application equipment is sufficient to adequately apply the coating.

C. For each coating system, provide the manufacturer’s application guidelines including:

1. Surface preparation guidelines.
2. Primer type, where required.
3. Maximum wet and dry thickness per coat.
4. Minimum and maximum curing time between coats, and atmospheric conditions for each.
5. Curing time before submergence in municipal wastewater.
6. Thinner to be used with each coating.
7. Ventilator requirements.
8. Allowable application methods.
9. Maximum storage life.

10. Material safety data sheets.
11. Interpretation of batch code numbers.
12. Minimum and maximum relative humidity requirements.
13. Minimum and maximum surface temperature requirements.
14. Minimum and maximum ambient temperature requirements.
15. Manufacturer's recommended application procedure.

D. Provide information on planned surface preparation procedures including, when relevant, abrasive media, minimum water cleaning pressure and flow rate (e.g. 5000psig @ 4gpm), nozzle types (e.g. zero degree rotating nozzle), etc. for coating systems specified. Surface preparation methods shall be based upon the conditions of the substrate and the requirements of the protective coating to be applied. Whichever method(s) are used, they shall be performed in a manner that provides a uniform, sound, clean neutralized surface. At the request of the Engineer, the Contractor shall test for adverse chemical conditions that may hinder overall product performance.

E. Maintenance of Traffic Plan including, but not limited to, specific dates that the Maintenance of Traffic Plan shall be in place.

F. Wastewater removal plan for septic tanks and storage tanks.

G. List of all test equipment to be used, copies of the adhesive and equipment's instructions, adhesives, calibration procedures, MSDS sheets, and copies of all reference standards related to the test equipment.

H. Submit technical data sheets on each product used, including ASTM test results indicating the product conforms to and is suitable for its intended use per these specifications.

1.06 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

A. General

1. Deviations from the manufacturer's printed instructions will not be allowed unless approved in writing by the Engineer.
2. In the event of a discrepancy between the Contractor's, manufacturer's or MDT Inspector's testing equipment, all parties shall check equipment in question for proper function and calibration.
3. Where there is a conflict between the manufacturer's recommendations and these Technical Specifications, the manufacturer's recommendations shall govern.
4. Test equipment and procedures shall be the same throughout the Contract.
5. **Quality Control:** Contractor shall be responsible for the quality control of the coatings applied including surface preparation, testing, verifying access, dimensions, configuration, pipe connections, appurtenances, and details of each manhole or structure prior to commencing any Work as well as remedial work to be completed as identified by inspection at the given check points.

6. **Quality Assurance:** The Engineer shall approve the Contractor's Work regarding surface preparation and quality control of the coatings applied. This documentation in no way relieves the Contractor of the responsibilities described under this Contract. The Engineer may conduct tests on ambient conditions, pH and surface temperature, coating(s) applied, wet and dry film thickness, coating type coating batch numbers, and other tests.

B. QA/QC Check Points

1. **pH Testing:** Prior to surface preparation for cementitious coating application, measure and record pH of the manhole or structure's interior surface and other parameters as required by coating manufacturer to verify acceptable existing substrate conditions for application of the specified product and to document compliance with warranty requirements. After surface preparation and prior to coating system being applied to the interior of a manhole or structure (excluding coatings to only the interior of a chimney), measure and record pH of the manhole or structure's interior surface in at least two locations as approved by the Engineer. Adjust if required by the coating system manufacturer and per NACE 6/SSPC SP 13 Table 1 for severe service.

2. **Concrete surface tensile strength:** After surface preparation (including repair and resurfacing products) and prior to a polymer coating system being applied to the interior of a manhole or structure (excluding coatings to only the interior of a chimney and spot type only repairs) measure and record the results of a minimum of two concrete surface tensile strength tests, without glue failures, per manhole or structure at locations as directed by the Engineer. Tests shall be per ASTM D4541 as modified herein. Utilize a 20 mm test dolly and portable pull-off adhesion tester. Document test failure mode. Failure of the dolly adhesive shall require retesting. If the concrete surface tensile strength is less than 200 psi (NACE 6/SSPC SP 13 Table 1 for light service) notify manufacturer and Engineer for approval before applying coating. (Destructive testing as defined herein shall be performed on the initial manhole or structure coated with a particular coating system. After the initial test, 50% of the manholes and structures coated may require testing as selected by the Engineer. Initial and additional testing required due to test failures shall be at the Contractor's expense.)

3. **Wet Film Thickness (WFT):** During coating system application, measure and record WFT of the coating in at least four locations in the manhole or structure (one in a chimney) or as directed by the Engineer. Use an industry standard WFT gage (ASTM D4414) designed for thick coatings. Minimum WFT thickness is specified for each product in the article headed "Coating System Specification Sheets" in this Section of the Technical Specifications.

4. **Surface Moisture:** After preliminary surface preparation and prior to a polymer coating system being applied to the interior of a manhole or structure, measure and record surface moisture of the manhole or structures interior surface in at least two locations per ASTM D426 and use a DELMHORST ACCUSCAN moisture meter using a 0 to 100 relative scale.

5. **Blotter Test:** Upon startup of abrasive blasting, compressed air shall be checked daily for oil and water by blotter test per ASTM D4285.
6. **Anchor Profile of Surface:** After preliminary surface preparation and prior to coating application to the interior of a manhole or structure (excluding coatings only for interior of a chimney) compare and record anchor profile by comparison to various grits of sand paper.
7. **Surface Preparation:** Shall be accepted by the coating system manufacturer prior to the application of the coating system.
8. **Ambient Conditions:** Measure and record the test results for relative humidity, manhole or structure wall surface temperature, dew point and ambient temperature to ensure compliance for materials applied.
9. **Coating Adhesion:** After polymer coating system application and cure, measure and record the results of a minimum of two adhesion tests, without glue failures, per manhole or structure at locations within the manhole or structure as directed by the Engineer. Tests shall be per ASTM D4541 as modified herein. Utilize a 20 mm test dolly and portable pull-off adhesion tester. Document test failure mode, whether failure is within the substrate, failure is within the coating, or failure is at the coating/substrate interface. Failure of the dolly adhesive shall require retesting. If the testing damages the coating, spot repair the test location while following manufacturer's recommendations. Failure at the coating/substrate interface with less than 10% of substrate adhered to the coating and less than 100 psi pull-off strength, shall be deemed a coating system failure and the Contractor shall remove the coating to soundly adhered edges, re-perform surface preparation procedures, and recoat the failed surfaces, at the Contractor's expense. Low pull-off strength values (<150 psi) may require additional testing/evaluation to determine potential adhesion defects at the sole discretion of the Engineer. (Destructive adhesion testing as defined herein shall be performed on the initial manhole or structure coated with a particular coating system. After the initial test, 25% of the manholes and structures coated may require testing as selected by the Engineer. Initial and additional testing required due to test failures shall be at the Contractor's expense.)
10. **Holiday Testing:** The finished polymer coating shall be inspected per ASTM D-4787 "Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates", using high-voltage spark testing equipment with variable settings. Test voltage shall be set at an initial 100 volts per mil (4,000 volts per mm) of specified film thickness, and then increased as needed to compensate for relative conductivity of the concrete substrate by spark testing an induced holiday at furthest extension of test probe from grounding location. Once test voltage is determined, it shall be used throughout that area, and then re-determined again every time a new ground is made. Detected holidays shall be marked and repaired per coating manufacturer's recommendations. Contractor shall be responsible to provide necessary Holiday Testing equipment for final inspection. Pinhole testing shall be accomplished using a Tinker Razor Holiday Detector, San Gabriel, CA, Model AP/W or an Engineer approved equal model. A test voltage of 100 volts/mil is recommended. This test shall identify and allow for the repair of pinholes in order to ensure a continuous

pinhole-free coating. (Testing shall only be required where full depth manhole or structure coating is specified.)

1.07 CONTAINMENT AND SITE CONDITIONS

A. No construction materials, solvents, chemicals, blasting media, or debris of any sort shall be allowed to be discharged to the wastewater collection system. Water from pressure washing (>100 psi) may be allowed to enter the system after any debris has settled, when it demonstrated to the satisfaction of the Engineer that no debris will enter the collection system. Water applied at less than 100 psi and containing common, household strength detergents, which are used strictly for rinsing the interior surfaces of the structure, may be allowed into the system as long as no debris are washed into the system. All odors noticeable by the average person shall be confined to an area within 10 feet of the structure. The Contractor shall provide odor control equipment or methods so odors are confined and in conjunction with closed space entry or other safety requirements.

B. Provide environmental controls such as ventilators if the cure time of the coating is slowed by the presence of coating or solvent vapor, and heaters and/or dehumidification as necessary to meet coating application requirements.

C. Applicator shall conform to all local, state, and federal regulations including those set forth by OSHA, RCRA, and the EPA.

1.08 WARRANTY

The Contractor shall unconditionally guarantee all manhole and structure rehabilitation Work in this Contract against defects of materials and workmanship for a period of 3 years under normal use, operation, and service.

The Contractor and coating manufacturer shall warrant all manhole and structure coating Work in this Contract against defects of materials and workmanship for a period of 10 years under normal use, operation, and service. The Contractor shall provide all testing and prepare all required installation reports, warranty registration documentation, etc. and submit same to the coating manufacturer and Engineer on behalf of MDT. The Contractor shall furnish a warranty certificate from the cementitious coating manufacturer indicating acceptance and commencement of the warranty period. The Contractor and coating manufacturer shall, within one (1) month of written notice thereof, propose an acceptable method and repair any defects (including all labor and materials) that may develop during the warranty period in a manner acceptable to the Engineer and at no cost to MDT. Defects shall be defined as: visible leakage of groundwater into the manhole or structure or separation of any part of the coating from the host manhole or structure or coating interfacing joints.

1.09 MATERIALS

A. **Coating Products:** Manhole and structure coating systems shall be polymer based Product A-1, A-2, A-3 or Engineer approved equal.

B. **Repair and Resurfacing Products:** Repair materials must be compatible with specified manhole or structure coating products and selected to minimize curing time. The following products may be accepted and approved as compatible:

1. 100% solids, solvent-free epoxy grout specifically formulated to be suitable for top-coating with the specified coating product(s).

2. Factory blended, rapid setting, high early strength, fiber reinforced, non-shrink repair mortar that can be troweled or pneumatically spray applied, and specifically formulated to be suitable for top-coating with the specified coating product(s).Adeka P-201 or approved equal Hydrophilic self-swelling rubber sealing material.

C. Internal Chimney Sealant

1. The chimney sealant shall be minimum 170 mils thick of corrosion resistant aromatic flexible urethane resin coating applied to the inside wall of the chimney and manhole frame casting. The product shall have a minimum elongation of 800% and a Durometer of 75. The seal shall remain flexible allowing repeated vertical or horizontal movements of the manhole frame due to frost lift, ground movement or the thermal movement of pavements.

2. The chimney sealant shall have a minimum tensile and adhesion strength of 1150 PSI and 175 lb. per linear inch respectively. The chimney sealing system shall conform to the physical requirements of ASTM D412. The chimney sealant shall be Flex-Seal Utility Sealant as manufactured by Sealing Systems, Inc. or approved equal.

D. **Standardization:** Materials, supplies, and articles provided shall be the standard products of the manufacturers and coating system specified. Coatings in a particular system shall be the products of a single manufacturer.

E. **Delivery, Storage and Handling:** Deliver materials for field application to the job site in their original, unopened, undamaged containers. Each container shall bear the manufacturer's name brand, batch number, date of manufacture, and storage life. Coatings shall be stored in enclosed structures and shall be protected from weather, excessive high or low temperatures, and spills. Coatings exceeding storage life recommended by the manufacturer or that have been visibly damaged shall be removed from the site. Coating materials are to be stored and handled in accordance with their material safety data sheets.

1.10 REPAIR AND PREPARATION

A. **Safety:** all work proposed within existing manholes and tanks shall be complete in a safe manner in accordance with all state and federal requirements.

1. Contractor and contractors' workers shall be certified for confined space entry prior to starting the work. All certifications shall be provided to the Owner prior to the start of work. All state and federal requirements for work within confined spaces shall be followed while performing with work.

B. **Repair of Bench and Channel:** Manhole bench, flow channels, and inverts shall be repaired and/or constructed as directed in order to provide smooth flow characteristics and transition of flow through the manhole.

1. Contractor shall prepare, clean, and repair/rebuild manhole bench and flow channel(s) in the same manner as described above. Remove obstructions and loose materials from bench prior to shaping the channel and invert. Using repair/resurfacing mortar, form a smooth, U-shaped channel having a minimum depth of one-half pipe diameter across the floor of the manhole using approved manhole rehabilitation materials. The top edge of the bench at the manhole wall shall be set at an elevation above one-half diameter of the adjacent pipe(s) and sloped at 1-inch per foot to drain toward the flow-through channel and outgoing pipe, and to intersect the channel edge at the one-half diameter level. Active flow shall be diverted as required to allow sufficient setting time for material used.

2. Form a smooth transition with a reshaped channel invert and a raised manhole bench to eliminate sharp edges on the pipe, bench, channel, or invert. Build up and smooth the invert of manhole to match flow line of the connecting pipes. Channel build-up and surface preparation for manholes to be coated shall be in accordance with the article headed “Preparation” in this Section of the Technical Specifications.

3. Finished benches, channels and inverts shall be smooth and without defects which would allow for accumulation of debris. Finished benches, channels and inverts shall conform to the Standard Details included in the Appendix.

C. Repair/Replacement of Chimney and Frame and Cover Casting

1. Chimney: Manholes or structures that have defective chimneys, frames and/or covers, or covers below grade will be designated for adjustment or replacement of the frame and cover. The Work shall include the following:

a. Saw cut and remove existing asphaltic or concrete pavement if necessary. Existing brick or paver stone pavement shall be carefully removed without cutting and salvaged for reuse. Excavate to at least 6 inches below the bottom of the chimney replacement.

b. Remove the existing manhole frame and cover casting, salvage and reuse the existing casting where adjustment is required. Frames broken during removal or handling by the Contractor shall be replaced at the Contractor’s expense.

c. Remove loose, cracked, broken, deteriorated, deficient or otherwise unsound existing chimney materials as required or directed by the Engineer. Existing Portland cement brick shall be removed and replaced regardless of condition. Where existing frame and cover castings are being replaced with a larger frame and cover casting, the existing chimney/corbel shall be removed and replaced as required to provide a chimney that matches the opening of the larger replacement frame casting. Existing surfaces shall be cleaned and prepared for chimney replacement.

d. Replace existing chimney with new specified materials. The elevation and horizontal position of the frame shall be adjusted as necessary by installing

precast grade adjustment rings to obtain the desired elevation. The frame and cover elevation and cross slope shall match the existing adjacent pavement. The frame and cover elevation shall be minimum 1 inch above existing grade in unpaved areas, or higher as directed by the Engineer. No materials other than the prepared mortar bed shall be used to obtain final elevation and slope of the frame. The prepared mortar bed shall be minimum 1/2 inch thick.

e. Backfill the excavation and restore surfaces to a condition equal or better than the existing condition prior to construction, in accordance with the requirements of the Contract Documents.

D. General Coating Preparation

1. Surfaces to be coated shall be cleaned and prepared per the coating manufacturer's recommendations. Before applying coating, all contaminants including wastewater, oil, grease, dirt, rust, loose mill scale, waxes, efflorescence, sealers, salts, old coatings, and other foreign substances shall be removed. Oil and grease shall be removed before mechanical cleaning (hydro-blasting) is started. Where mechanical cleaning is accomplished by abrasive blast cleaning, the abrasive used shall be washed, graded and free of contaminates which might interfere with the adhesion of the coating.

2. Steam cleaning, detergent, industrial degreasers, and/or hot water shall be used to clean wall surfaces unless this is contrary to the recommendations of the specific coating system manufacturer. Acid solutions shall not be used.

3. As necessary, wastewater flow shall be stopped, bypassed or diverted for the preparation and application of the coating product(s).

4. Contractor shall prepare, clean, and seal all manhole and structure wall penetrations in accordance with coating manufacturer's recommendations and as approved by the Engineer. Bench, channel, invert, chimney, and frame and cover casting repairs and/or replacements shall be completed before coatings are applied.

5. During surface preparation and coatings application, all nearby equipment, vehicles, structures, etc. shall be protected from blasting grit, dust and over sprayed, dropped or spilled materials. Surfaces adjacent to a proposed leading edge of coating application shall be taped-off or otherwise protected.

6. Clean cloths and clean fluids shall be used in solvent cleaning.

7. Contractor shall inspect all surfaces specified to receive a protective coating prior to surface preparation. Contractor shall notify Engineer of any noticeable disparity in the surfaces which may interfere with the proper preparation or application of the repair mortar and coating. Surface profile created by mechanical cleaning shall be per the coating manufacturer's recommendations.

8. Damaged surfaces shall be observed by the Engineer before repairs are made. Where concrete deterioration in a manhole or structure is severe, structural integrity may need to be restored prior to application of coating, at Engineer's approval.

9. All active infiltration must be eliminated prior to proposed repair with materials as recommended by the coating manufacturer.

10. Plug or place covers over all pipe openings to prevent extraneous material from entering the wastewater system.

E. Surface Preparation of Concrete and Masonry Surfaces

1. **Concrete:** prepare per SSPC SP13/NACE 6 "Surface Preparation for Concrete," and the coating manufacturer's recommendations. All leaks evidenced by indications of infiltration, shall be plugged with materials as recommended by coating manufacturer. Surface profile created by abrasive blasted surfaces shall be per the manufacturer's recommendation for the coating system.

F. Coating Interface with Adjoining Construction Materials

1. Coating product(s) shall interface with adjoining construction materials throughout the manhole or structure to effectively seal and protect concrete or masonry substrates from infiltration and attack by corrosive elements. Procedures and materials necessary to effect this interface shall be as recommended by the coating product(s) manufacturer and approved by the Engineer. Termination points of the polymer coating product(s) shall have a minimum three (3) inch interface overlap with each pipe penetration. Termination points of the cementitious coating product(s) shall have flush interface abutting each pipe penetration. Wastewater flow shall be stopped, bypassed or diverted for the preparation and application of the coating product(s) to the invert and interface with pipe materials.

G. **Final Cleaning:** The Contractor shall ensure that all surfaces to be coated are free of dust, moisture, and condensation. Nearby surfaces shall be cleaned to prevent contamination of substrate or freshly applied coatings.

H. **Internal Chimney Sealant Application**

1. All loose and protruding mortar that would interfere with the seal's performance shall be removed and the manhole frame casting, chimney and cone/corbel cleaned by wire brushing. Prepare the surface as required by the manufacturer.

2. Active infiltration shall be corrected in accordance with the requirements of the article headed "Elimination of Infiltration" in this Section of the Technical Specifications prior to installing the internal chimney sealant. Resurfacing/repair products shall be completely cured in accordance with the manufacturer's requirements prior to installing the internal chimney sealant. The substrate surface must be free of sand, loose debris, dust, dirt, oil, grease or chemical contamination. A blower may be required to completely dry the substrate surface as recommended by the manufacturer.

3. Ensure the frame casting and structure is clean and dry prior to applying the adhesive primer. Brush the adhesive primer onto the casting and structure surfaces where the sealant is intended to adhere, in accordance with the requirements of the manufacturer.

4. The chimney sealant shall be evenly brush applied to the required thickness after the adhesive primer has dried, in accordance with the requirements of the manufacturer.

5. The chimney sealant shall be applied and extend vertically from 1-inch above the frame seal to 2-inches below the chimney and cone/corbel joint.

1.11 COATING MATERIAL APPLICATION

A. **Workmanship:** Coating shall be conducted in accordance with the requirements of SSPC, Good Painting Practice, Volume 1.

1. Coated surfaces shall be free from significant runs, drips, ridges, waves, laps and brush marks, etc. Coats shall be applied so as to produce an even film of uniform thickness.
2. Coating equipment shall be designed for application of the materials specified.
    a. Compressors shall have traps and filters to remove water and oils.
    b. Spray equipment shall be equipped with mechanical agitators, pressure gages, and pressure regulators, and spray nozzles of the proper sizes and functioning in a manner suitable to perform the Work.
    c. The spray equipment shall be specifically designed to accurately ratio and apply the specified protective coating materials and shall be regularly maintained and in proper working order. Spray application equipment must be approved by the coating manufacturer and shall be used to apply each coat of the protective coating.
3. Each coat shall be applied evenly and sharply cut to line.

B. Coating Properties, Mixing, and Thinning

1. Coating shall provide a monolithic film with coverage of all specified surfaces and interfacing joints. Undercoats shall be sanded as required to provide a surface suitable for the proper application and adhesion of subsequent coats. Coating shall be thoroughly stirred, strained, and kept at a uniform consistency during application.
2. Coatings shall be mixed in accordance with the manufacturer's instructions.

C. Method of Coating Application

1. Where two or more coats are required, all coats shall be WFT tested.
2. Coating shall not be applied to a surface until it has been prepared as specified and approved for coating by the manufacturer.

D. Film Thickness and Continuity

1. Coating system thickness is the total thickness of primer and finish coats. Coatings shall be applied to the thickness specified.
2. Overspray, pinholes and other surface defects shall be repaired.

1.12 COATING SYSTEM SPECIFICATION SHEETS

Coating Systems specified for use appear on the following pages.

Coating System Identification: Product A-1

Manufacturer:	Raven Lining Systems, 13105 East 61st Street, Suite A, Broken Arrow, Oklahoma - 800-324-2810, 918-615-0020 or FAX 918-615-0140.
Product name:	Raven 405 Epoxy
Qualifications:	Applicator shall be trained and certified by the manufacturer as qualified to apply the specified coating. Provide references and documentation of certification and experience with submittals.
Material Classification:	100% solids, solvent free ultra-high build epoxy monolithic coating. Amine cured. Materials per ASTM D638-Test Method for Tensile Properties of Plastics, and ASTM D790-Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
Surfaces:	Field applied to existing manholes and structures. Coat all of interior of existing concrete manholes and structures, including channels, and interfacing pipe joints.
Color:	Light blue, others can be specified.
Compressive Strength:	18,000 psi per ASTM D695
Tensile Strength:	7,600 psi per ASTM D638
Flexural Strength:	13,000 psi per ASTM D790
Flexural Modulus:	600,000 psi minimum per ASTM D790
Bond:	Shall exceed tensile strength of substrate
Low Temp. Flexibility:	Per manufacturer, per ASTM D1790
Density:	Per manufacturer.
Recovery:	Per manufacturer
Service condition:	Immersed, non-potable, non-immersed, domestic wastewater, corrosive environment, interior and exterior water pressure, traffic areas.

Coating System Identification: **Product A-1**

Surface preparation:	Per the article headed "Preparation" in this Section of the Technical Specifications. Inject or hand pack grout to seal holes, leaks and seeping. Do not apply to surfaces that are wet (including condensation) or covered with running water.
Repair materials:	Patching groutand any other repair materials shall comply with the recommendations of the manufacturer. No holes or honeycomb surfaces should remain after the application of the repair mortar. Materials shall be fully cured before coating is applied.
Environmental controls:	Minimum 50 degrees F, Maximum 120 degrees F, less than 90 percent humidity and do not expose to rain or snow. Provide heaters, dehumidification, and ventilation as recommended by manufacturer and as needed to prevent condensation before and during cure. Provide wastewater bypass as necessary.
Design:	The coating thickness shall be designed to withstand the hydraulic load generated by the groundwater table. The invert and bench coating thickness shall be the same as that required at the bottom of the manhole or structure wall as determined by the manufacturer's standard engineering calculations for groundwater pressure. Coating thickness design to be based on the groundwater table being one foot below the ground surface. Testing required for design values of the flexural modulus of the coating will be verified by a third party independent testing lab paid for by the Contractor. The test results and design information for each individual structure shall be submitted to the Engineer for review.
Safety:	Contractor shall be certified for confined space entry prior to performing the work. Certification shall be provided to the Owner before starting work. All requirements of confined space entry shall be followed while performing the work.

Coating System Identification: Product A-1

Curing:	Generally, 6hrs at 70 degrees F curing time after the completion of spraying before subjecting the manhole or structure to active flow. Near maximum physical properties achieved in 8 hours. In cold weather, manhole and structures shall be protected while curing is in process to maintain temperatures above 50 F. No more than 24 hrs at 70 F between coats.
Thickness:	Per manufacturer's design. Minimum of 125 mils WFT. Maximum of 200 mils per coat recommended on vertical or overhead surfaces.
Tolerances:	Plus 20 mils or minus 10 mils.
Cleanup:	Acetone, xylene, or MEK. Dispose of solvent and debris as required by code.
Inspection Check Points:	See the article headed "Quality Assurance/Quality Control" in this Section of the Technical Specifications. Check Points 1 through 10.

Coating System Identification: Product A-2

Manufacturer:	SPRAYROQ, Inc., 4707 Alton Court, Birmingham, AL. 35210 - 205-957-0020 or Fax 205-957-0021or Fax 318-687-4337
Product name:	SPRAYWALL Polyurethane
Qualifications:	Applicator shall be trained and certified by the manufacturer as qualified to apply the specified coating. Provide references and documentation of certification and experience with submittals.
Material Classification:	Spray-applied monolithic urethane resin coating. Materials per ASTM D638-Test Method for Tensile Properties of Plastics, and ASTM D790-Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
Surfaces:	Field applied to existing manholes and structures. Coat all of interior of existing concrete manholes and structures, including channels, and interfacing pipe joints.
Color:	Natural color of resin
Compressive Strength:	18,000 psi per ASTM D695
Tensile Strength:	7,450 psi per ASTM D638
Flexural Strength:	12,000 psi per ASTM D790
Flexural Modulus:	735,000 psi per ASTM D790
Bond:	Shall exceed tensile strength of substrate
Low Temp. Flexibility:	Passing at -4 degrees F, per ASTM D1790
Density:	87 lb/cu. ft.
Recovery:	98 percent, per ASTM C920
Service condition:	Immersed, non-potable, non-immersed, domestic wastewater, corrosive environment, interior and exterior water pressure, traffic areas.

Coating System Identification: **Product A-2**

Surface preparation: Per the article headed "Preparation" in this Section of the Technical Specifications and including the application of manufacturer recommended primer for steel and cast iron. Inject or hand pack grout to seal holes, leaks and seeping. Do not apply to surfaces that are wet (including condensation) or covered with running water.

Repair materials: Patching grout and any other repair materials shall comply with the recommendations of the manufacturer. No holes or honeycomb surfaces should remain after the application of the repair mortar. Materials shall be fully cured before coating is applied.

Environmental controls: Minimum 50 degrees F temperatures, less than 90 percent humidity and do not expose to rain or snow. Provide heaters, dehumidification, and ventilation as recommended by manufacturer and as needed to prevent condensation before and during cure. Provide wastewater bypass as necessary.

Design: The urethane coating thickness shall be designed to withstand the hydraulic load generated by the groundwater table. The invert and bench coating thickness shall be the same as that required at the bottom of the manhole or structure wall as determined by the manufacturer's standard engineering calculations for groundwater pressure. Coating thickness design to be based on the groundwater table being one foot below the ground surface. Testing required for design values of the flexural modulus of the coating will be verified by a third-party independent testing lab paid for by the Contractor. The test results and design information for each individual structure shall be submitted to the Engineer for review.

Safety: Contractor shall be certified for confined space entry prior to performing the work. Certification shall be provided to the Owner before starting work. All requirements of confined space entry shall be followed while performing the work.

Coating System Identification: Product A-2

Application:	Field application manually sprayed onto all surfaces by trained technician who is experienced in the application of a spray applied urethane resin and has been certified by the manufacturer. Coating shall be applied within 48 hours of completion of surface preparation. The finished bench surfaces shall be smooth, free of ridges and will be sloped in the direction of flow. Special care shall be used to ensure a smooth transition between the new manhole invert and intersecting pipe inverts such that flow will not be impaired. Manufacturer to certify equipment proposed for use by Contractor.
Curing:	Minimum of 30 minutes curing time after the completion of spraying before subjecting the manhole or structure to active flow. A minimum of 3 hours curing time or until all sprayed materials have returned to the ambient temperature of the manhole or structure interior before. In cold weather, manhole and structures shall be protected while curing is in process to maintain temperatures above 50F.
Thickness:	Per manufacturer's design. 125 mils minimum thickness.
Tolerances:	Plus 20 mils or minus 10 mils.
Cleanup:	As required. Dispose of solvent and debris as required by code.
Inspection Check Points:	See the article headed "Quality Assurance/Quality Control" in this Section of the Technical Specifications. Check Points 1 through 10.

Coating System Identification: Product A-3

Manufacturer:	OBIC System LLC, 51511116 County Road 17, Bryan, OH 43506 (419) 633-3147
Product name:	OBIC Armor 1000
Qualifications:	Applicator shall be trained and certified by the manufacturer as qualified to apply the specified coating. Provide references and documentation of certification and experience with submittals.

Coating System Identification: Product A-3

Material Classification:	The protective lining system shall be a multi-layer/component protective lining system, OBIC including: Polyurea Adhesion Coating, Polymer Surface Layer, and Final Polyurea Armor Layer
Surfaces:	Field applied to existing manholes and structures. Coat all of interior of existing concrete manholes and structures, including channels, and interfacing pipe joints.
Color:	Bright Orange, Light Tan
Compressive Strength:	130-180 psi (surface layer)
Tensile Strength:	3,315 psi per ASTM D412
Flexural Strength:	Not specified
Ultimate Elongation:	395% per ASTM D412
Bond:	Shall exceed tensile strength of substrate
Low Temp. Flexibility:	Not specified
Density:	6-8 lb/cu. ft. (surface layer)
Recovery:	98 percent, per ASTM C920
Service condition:	Immersed, non-potable, non-immersed, domestic wastewater, corrosive environment, interior and exterior water pressure, traffic areas.

Coating System Identification: Product A-3

Surface preparation: Surface preparation methods may include high pressure water cleaning, hydro blasting, abrasive blasting, grinding, detergent water cleaning and shall be suited to provide a surface compatible for installation of the liner system. Surface preparation method shall produce a cleaned, abraded and sound surface with no evidence of laitance, loose concrete, brick or mortar, contaminants or debris, and shall display a surface profile suitable for application of liner system. After the defects in the structure are identified, repair all leaks with a chemical or hydraulic sealant designed for use in field sealing of ground water. Severe cracks shall be "repaired with a urethane-based chemical" sealant. Product to be utilized shall be as approved by owner/engineer prior to installation. Repairs to exposed rebar, defective pipe penetrations or inverts, etc. shall be repaired utilizing non-shrink grout or approved alternative method.

Repair materials: Repair materials shall be used to fill voids, structurally reinforce and/or rebuild surfaces. Repair materials shall be compatible with the polyurea coating and shall be applied in accordance with the manufacturer's recommendations. Subject to compliance with the polyurea coating manufacturer's requirements, the following products shall be acceptable as compatible repair base coat materials for polyurea top coating:

- A hydraulic cement and/or plug shall be used to stop active infiltration. The hydraulic cement and plug shall be suitable for the polyurea top coating and shall be approved by the polyurea coating manufacturer.
- Hydrophobic and/or Hydrophilic polyurethane chemical grouts used to stop active infiltration. The chemical grouts shall be suitable for the polyurea top coating and shall be approved by the polyurea coating manufacturer.

Coating System Identification: Product A-3

Environmental controls: Minimum 50 degrees F temperatures, less than 90 percent humidity and do not expose to rain or snow. Provide heaters, dehumidification, and ventilation as recommended by manufacturer and as needed to prevent condensation before and during cure. Provide wastewater bypass as necessary.

Design: The urethane coating thickness shall be designed to withstand the hydraulic load generated by the groundwater table. The invert and bench coating thickness shall be the same as that required at the bottom of the manhole or structure wall as determined by the manufacturer's standard engineering calculations for groundwater pressure. Coating thickness design to be based on the groundwater table being one foot below the ground surface. Testing required for design values of the flexural modulus of the coating will be verified by a third-party independent testing lab paid for by the Contractor. The test results and design information for each individual structure shall be submitted to the Engineer for review.

Safety: Contractor shall be certified for confined space entry prior to performing the work. Certification shall be provided to the Owner before starting work. All requirements of confined space entry shall be followed while performing the work.

Application: A. Field application manually sprayed onto all surfaces by trained technician who is experienced in the application of a spray applied urethane resin and has been certified by the manufacturer. Coating shall be applied within 48 hours of completion of surface preparation. The finished bench surfaces shall be smooth, free of ridges and will be sloped in the direction of flow. Special care shall be used to ensure a smooth transition between the new manhole invert and intersecting pipe inverts such that flow will not be impaired. Manufacturer to certify equipment proposed for use by Contractor. Application procedures shall conform to recommendations of the manufacturer, including materials handling, mixing, environmental controls during application, safety and spray equipment. Spray equipment shall be specifically designed to accurately ratio and apply the liner system. Application of multi-layer/component liner system shall be in strict accordance with manufacturer's recommendation.

Coating System Identification: Product A-3

Curing:	Minimum of 30 minutes curing time after the completion of spraying before subjecting the manhole or structure to active flow. A minimum of 3 hours curing time or until all sprayed materials have returned to the ambient temperature of the manhole or structure interior before. In cold weather, manhole and structures shall be protected while curing is in process to maintain temperatures above 50F.
Thickness:	Per manufacturer's design. Final installation shall be a minimum of ½" (500 mils). Adhesion Layer 40-50 mils (not intended to fill small voids) Surfacer Layer 400 to 450 mils (intended to fill voids, bug holes) Armor Layer 50 to 60 mils
Tolerances:	Provided above in "Thickness".
Cleanup:	As required. Dispose of materials and debris as required by code.
Inspection Check Points:	Final liner system shall be completely free of pinholes or voids. Liner thickness shall be the minimum value as described herein. Due to the fast gel and set time of the material, thickness of the application can be verified by awl point depth checks into the surface component and physical removal of a small area of the polyurea material. Repair of the test areas to be done immediately after the test. High Voltage Holiday Detection shall be used to inspect for pinholes or breaches in the liner system installation. Visual inspection shall be made by the Owner/Engineer. Any deficiencies in the finished liner system shall be marked and repaired according to the procedures set forth by the Manufacturer. The wet well may be returned to full operational service as soon as the final inspection has taken place.

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AWARD COPY

DENA MORA REST AREA IM

90-1(236)5
UPN NUMBER 9432001

ARCHITECTURAL SPECIAL PROVISIONS (VOLUME 3)

VOLUME 3 OF 3

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SECTION 00 0110
TABLE OF CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS

1.1 **DIVISION 00 -- PROCUREMENT AND CONTRACTING REQUIREMENTS**

A. 00 0110 - Table of Contents

SPECIFICATIONS

2.1 **DIVISION 01 -- GENERAL REQUIREMENTS**

A. 01 2000 - Price and Payment Procedures
B. 01 3000 - Administrative Requirements
C. 01 4000 - Quality Requirements
D. 01 5000 - Temporary Facilities and Controls
E. 01 6000 - Product Requirements
F. 01 7000 - Execution and Closeout Requirements
G. 01 7419 - Construction Waste Management and Disposal
H. 01 7800 - Closeout Submittals
I. 01 7900 - Demonstration and Training

2.2 **DIVISION 02 -- EXISTING CONDITIONS**

A. 02 4100 - Demolition

2.3 **DIVISION 03 -- CONCRETE**

A. 03 3000 - Cast-in-Place Concrete

2.4 **DIVISION 04 -- MASONRY**

A. 04 2000 - Unit Masonry

2.5 **DIVISION 05 -- METALS**

2.6 **DIVISION 06 -- WOOD, PLASTICS, AND COMPOSITES**

A. 06 1000 - Rough Carpentry
B. 06 1753 - Shop-Fabricated Wood Trusses

2.7 **DIVISION 07 -- THERMAL AND MOISTURE PROTECTION**

A. 07 1113 - Bituminous Dampproofing
B. 07 4213 - Metal Wall Panels
C. 07 6200 - Sheet Metal Flashing and Trim
D. 07 7100 - Roof Specialties
E. 07 7200 - Roof Accessories
F. 07 9200 - Joint Sealants

2.8 **DIVISION 08 -- OPENINGS**

A. 08 1113 - Hollow Metal Doors and Frames
B. 08 7100 - Door Hardware
C. 08 8000 - Glazing

2.9 **DIVISION 09 -- FINISHES**

A. 09 9113 - Exterior Painting

B. 09 9123 - Interior Painting

2.10 **DIVISION 10 -- SPECIALTIES**

A. 10 1400 - Signage

B. 10 4400 - Fire Protection Specialties

END OF SECTION

SECTION 01 2000
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SCHEDULE OF VALUES

A. Use Schedule of Values Form: As stipulated in the Agreement.

1.2 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Execute certification by signature of authorized officer.

C. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

D. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.

E. Submit an electronic copy in PDF format for each Application for Payment.

1.3 MODIFICATION PROCEDURES

A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to the Contract Documents.

B. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.

C. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.

D. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

E. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

1.4 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL - NOT USED

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 **PROGRESS MEETINGS**

A. Contractor will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

B. Attendance Required:

1. Contractor.
2. Owner.
3. Architect.
4. Special consultants.
5. Contractor's superintendent.
6. Major subcontractors.

C. Record minutes and distribute copies within four days after meeting to participants, with copies to Architect, Contractor, participants, and those affected by decisions made.

3.2 **DAILY CONSTRUCTION REPORTS**

A. Prepare a daily construction report, recording the following information concerning events at the site; and submit duplicate copies to the Consultant at weekly intervals:

3.3 **CONSTRUCTION PROGRESS SCHEDULE**

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

3.4 **REQUESTS FOR INTERPRETATION (RFI)**

A. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of the Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.

1. Prepare a separate RFI for each specific item.
    a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
    b. Do not forward requests which solely require internal coordination between subcontractors.
2. Prepare in a format and with content acceptable to Owner.
3. Prepare using an electronic version of the form appended to this section.
4. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

B. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
1. Include in each request Contractor's signature attesting to good faith effort to determine from the Contract Documents information requiring interpretation.
2. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
    a. Approval of submittals (use procedures specified elsewhere in this section).
    b. Approval of substitutions (see Section - 01 6000 - Product Requirements)
    c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).

C. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
1. Official Project name and number, and any additional required identifiers established in Contract Documents.
2. Owner's, Architect's, and Contractor's names.
3. Discrete and consecutive RFI number, and descriptive subject/title.
4. Issue date, and requested reply date.
5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

D. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

E. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.

F. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.

1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

G. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.

1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.5 **SUBMITTAL SCHEDULE**

A. Submit to Architect for review a schedule for submittals in tabular format.

1. Coordinate with Contractor's construction schedule and schedule of values.
2. Format schedule to allow tracking of status of submittals throughout duration of construction.
3. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered and role and name of subcontractor.

4. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
    a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.6 **SUBMITTALS FOR REVIEW**

A. When the following are specified in individual sections, submit them for review:
    1. Product data.
    2. Shop drawings.
    3. Samples for selection.
    4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.7 **SUBMITTALS FOR INFORMATION**

A. When the following are specified in individual sections, submit them for information:
    1. Design data.
    2. Sustainability design submittals and reports.
    3. Certificates.
    4. Test reports.
    5. Inspection reports.
    6. Manufacturer's instructions.
    7. Manufacturer's field reports.
    8. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner.

3.8 **SUBMITTALS FOR PROJECT CLOSEOUT**

A. Submit Correction Punch List for Substantial Completion.

B. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
    1. Project record documents.
    2. Operation and maintenance data.
    3. Warranties.

4. Bonds.
5. Other types as indicated.

C. Submit for Owner's benefit during and after project completion.

3.9 **NUMBER OF COPIES OF SUBMITTALS**

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
1. After review, produce duplicates.
2. Retained samples will not be returned to Contractor unless specifically so stated.

3.10 **SUBMITTAL PROCEDURES**

A. General Requirements:
1. Use a separate transmittal for each item.
2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
3. Transmit using approved form.
a. Use Contractor's form, subject to prior approval by Architect.
4. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
6. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
7. Schedule submittals to expedite the Project, and coordinate submission of related items.
a. For each submittal for review, allow 7 days excluding delivery time to and from the Contractor.
b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.
8. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.

9. When revised for resubmission, identify all changes made since previous submission.
10. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
11. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
12. Submittals not requested will not be recognized or processed.

B. Product Data Procedures:
1. Submit only information required by individual specification sections.
2. Collect required information into a single submittal.
3. Submit concurrently with related shop drawing submittal.
4. Do not submit (Material) Safety Data Sheets for materials or products.

C. Samples Procedures:
1. Transmit related items together as single package.
2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3.11 **SUBMITTAL REVIEW**

A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.

C. Architect's actions will be reflected by marking each returned submittal using actual stamp on hard copies of submittals.
1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.

D. Architect's and consultants' actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
a. "Approved", or language with same legal meaning.
b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
1. At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
1. Resubmit corrected item, with review notations acknowledged and incorporated. Resubmit separately, or as part of project record documents.
2. Non-responsive resubmittals may be rejected.
2. Not Authorizing fabrication, delivery, and installation:

a. "Revise and Resubmit".
   1. Resubmit revised item, with review notations acknowledged and incorporated.
   2. Non-responsive resubmittals may be rejected.

b. "Rejected".
   1. Submit item complying with requirements of Contract Documents.

E. Architect's and consultants' actions on items submitted for information:

1. Items for which no action was taken:
   a. "Received" - to notify the Contractor that the submittal has been received for record only.

2. Items for which action was taken:
   a. "Reviewed" - no further action is required from Contractor.

END OF SECTION

SECTION 01 4000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 DEFINITIONS

A. Contractor's Quality Control Plan: Contractor's management plan for executing the Contract for Construction.

1.2 SUBMITTALS

A. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the contract documents, or for Owner's information.

B. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.

1. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the contract documents, or for Owner's information.

C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.

1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

E. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.

1. Submit report in duplicate within 30 days of observation to Architect for information.
2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the contract documents.

F. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.

1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the contract documents.
2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.

1.3 **QUALITY ASSURANCE**

A. Testing Agency Qualifications:
   1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time specialist and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
   3. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

B. Contractor's Quality Control (CQC) Plan:
   1. Prior to start of work, submit a comprehensive plan describing how contract deliverables will be produced. Tailor CQC plan to specific requirements of the project. Include the following information:
      a. Management Structure: Identify personnel responsible for quality. Include a chart showing lines of authority.

1.4 **REFERENCES AND STANDARDS**

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

D. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 **CONTROL OF INSTALLATION**

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.2 **MOCK-UPS**

A. Before installing portions of the Work where mock-ups are required, for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.

B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.

C. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.

D. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

E. Accepted mock-ups shall be a comparison standard for the remaining Work.

3.3 **DEFECT ASSESSMENT**

A. Replace Work or portions of the Work not complying with specified requirements.

B. If, in the opinion of Owner, it is not practical to remove and replace the work, Owner will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 TEMPORARY UTILITIES

A. Owner will provide the following:
   1. Electrical power and metering, consisting of connection to existing facilities.
   2. Water supply, consisting of connection to existing facilities.

B. Existing facilities may be used.

1.2 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Maintain daily in clean and sanitary condition.

1.3 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide protection for plants designated to remain. Replace damaged plants.

1.4 FENCING

A. Construction: Contractor's option.

B. Provide 6 foot (1.8 m) high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.5 SECURITY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.6 VEHICULAR ACCESS AND PARKING

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Coordinate access and haul routes with governing authorities and Owner.

C. Provide and maintain access to fire hydrants, free of obstructions.

1.7 WASTE REMOVAL

A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

C. Provide containers with lids. Remove trash from site weekly.

1.8 **FIELD OFFICES**

A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table.

B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 6000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

1.2 QUALITY ASSURANCE

A. Cradle-to-Cradle Certified: End use product certified Cradle-to-Cradle v2 Basic or Cradle-to-Cradle v3 Bronze, minimum, as evidenced by C2C (DIR).

B. Environmental Product Declaration (EPD): Publicly available, critically reviewed life cycle analysis having at least a cradle-to-gate scope.

1. Good: Product-specific; compliant with ISO 14044.
2. Better: Industry-wide, generic; compliant with ISO 21930, or with ISO 14044, ISO 14040, ISO 14025, and EN 15804; Type III third-party certification with external verification, in which the manufacturer is recognized as the program operator.
3. Best: Commercial-product-specific; compliant with ISO 21930, or with ISO 14044, ISO 14040, ISO 14025, and EN 15804; Type III third-party certification with external verification, in which the manufacturer is recognized as the program operator.
4. Where demonstration of impact reduction below industry average is required, submit both industry-wide and commercial-product-specific declarations; or submit at least 5 declarations for products of the same type by other manufacturers in the same industry.

C. GreenScreen Chemical Hazard Analysis: Ingredients of 100 parts-per-million or greater evaluated using GreenScreen (METH).

1. Good: GreenScreen (LIST) evaluation to identify Benchmark 1 hazards; a Health Product Declaration includes this information.
2. Better: GreenScreen Full Assessment.
3. Best: GreenScreen Full Assessment by GreenScreen Licensed Profiler.
4. Acceptable Evidence: GreenScreen report.

D. Health Product Declarations (HPD): Complete, published declaration with full disclosure of known hazards, prepared using one of the HPDC (HPD-OLT) online tools.

PART 2 PRODUCTS

2.1 **EXISTING PRODUCTS**

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.

B. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.2 **NEW PRODUCTS**

A. Provide new products unless specifically required or permitted by the Contract Documents.

2.3 **PRODUCT OPTIONS**

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

PART 3 EXECUTION

3.1 **SUBSTITUTION LIMITATIONS**

A. Architect will consider requests for substitutions only within 15 days after date of Agreement.

B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

D. A request for substitution constitutes a representation that the submitter:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
2. Agrees to provide the same warranty for the substitution as for the specified product.
3. Agrees to coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Architect.

4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Agrees to reimburse Architect and Architect for review or redesign services associated with re-approval by authorities.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure (after contract award):
1. Submit two copies of request for substitution for consideration. Limit each request to one proposed substitution.
2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
3. The Architect will notify Contractor in writing of decision to accept or reject request.

END OF SECTION

SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SUBMITTALS

A. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.

B. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.2 PROJECT CONDITIONS

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

C. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

D. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

E. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

PART 2 PRODUCTS

2.1 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

PART 3 EXECUTION

3.1 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:

3.2 GENERAL INSTALLATION REQUIREMENTS

A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.

B. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

F. Make neat transitions between different surfaces, maintaining texture and appearance.

3.3 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:

1. Complete the work.
2. Fit products together to integrate with other work.
3. Provide openings for penetration of mechanical, electrical, and other services.
4. Match work that has been cut to adjacent work.
5. Repair areas adjacent to cuts to required condition.
6. Repair new work damaged by subsequent work.
7. Remove samples of installed work for testing when requested.
8. Remove and replace defective and non-complying work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

D. Patching:

1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

3.4 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

3.5 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.6 FINAL CLEANING

A. Owner will provide comprehensive cleaning after final acceptance.

B. Execute final cleaning prior to final project assessment.

C. Use cleaning materials that are nonhazardous.

D. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces,

E. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

F. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

3.7 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

B. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

C. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

D. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

E. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

END OF SECTION

SECTION 01 7419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.1 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

PART 2 PRODUCTS

2.1 PRODUCT SUBSTITUTIONS

A. See Section 01 6000 - Product Requirements for substitution submission procedures.

PART 3 EXECUTION

3.1 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.

D. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

E. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

F. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

G. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 01 7800
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.

B. Operation and Maintenance Data:

1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.

C. Warranties and Bonds:

1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed shop drawings, product data, and samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

3.2 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

3.3 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:

1. Product data, with catalog number, size, composition, and color and texture designations.
2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

3.4 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
1. Description of unit or system, and component parts.
2. Identify function, normal operating characteristics, and limiting conditions.
3. Include performance curves, with engineering data and tests.
4. Complete nomenclature and model number of replaceable parts.

B. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

C. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

3.5 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Binders: Commercial quality, 8-1/2 by 11 inch (216 by 280 mm) three D side ring binders with durable plastic covers; three inch (76 mm) maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

3.6 **WARRANTIES AND BONDS**

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

END OF SECTION

SECTION 01 7900
DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.1 SUBMITTALS

A. Draft Training Plans: Contractor will designate personnel to be trained; tailor training to needs and skill-level of attendees.

B. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.

C. Training Reports:

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 DEMONSTRATION - GENERAL

A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.

B. Demonstrations conducted during Functional Testing need not be repeated unless Owner personnel training is specified.

C. Demonstration may be combined with Owner personnel training if applicable.

D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.

E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.

3.2 TRAINING - GENERAL

A. Commissioning Authority will prepare the Training Plan based on draft plans submitted.

B. Conduct training on-site unless otherwise indicated.

C. Owner will provide classroom and seating at no cost to Contractor.

D. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Commissioning Authority.

E. Provide training in minimum two hour segments.

F. The Commissioning Authority is responsible for determining that the training was satisfactorily completed and will provide approval forms.

G. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.

END OF SECTION

SECTION 02 4100
DEMOLITION

PART 1 GENERAL

1.1 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.1 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   5. Provide, erect, and maintain temporary barriers and security devices.

B. Do not begin removal until built elements to be salvaged or relocated have been removed.

C. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

D. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

E. Perform demolition in a manner that maximizes salvage and recycling of materials.

3.2 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

3.3 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.

B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

C. Remove existing work as indicated and as required to accomplish new work.

D. Services (Including but not limited to Plumbing, Electrical and Telecommunications): Remove existing systems and equipment as indicated.

E. Protect existing work to remain.

3.4 **DEBRIS AND WASTE REMOVAL**

A. Remove debris, junk, and trash from site.

END OF SECTION

SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 PRICE AND PAYMENT PROCEDURES

A. Concrete - Slab-on-Grade: Includes formwork, reinforcement, concrete, placement accessories, consolidating and leveling, troweling, and curing. Measurement by:
   1. Cubic yard (meter).

B. Concrete - Miscellaneous Locations: Includes formwork, reinforcement, concrete, placement accessories, consolidating, and curing. Measurement by:
   1. Cubic yard (meter).

C. Concrete - Grouting: Includes preparation of substrate, grout, placement, consolidating, troweling, and curing. Measurement by the cubic yard (meter).

1.2 SUBMITTALS

A. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

B. Test Reports: Submit report for each test or series of tests specified.

C. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.

D. Sustainable Design Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used.

E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.3 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Follow recommendations of ACI 306R when concreting during cold weather.

1.4 WARRANTY

A. Slabs with Moisture Vapor Reducing Admixture (MVRA): Provide warranty to cover the cost of flooring failures due to moisture migration from slabs for ten years.
   1. Include cost of repair or removal of failed flooring, placement of topical moisture remediation system, and replacement of flooring with comparable flooring system.

PART 2 PRODUCTS

2.1 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
2. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.

2.2 REINFORCEMENT MATERIALS

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).

1. Type: Deformed billet-steel bars.
2. Finish: Unfinished, unless otherwise indicated.

B. Steel Welded Wire Reinforcement (WWR): Plain type, ASTM A1064/A1064M.

C. Reinforcement Accessories:

1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch (1.29 mm).
2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
3. Provide galvanized, plastic or plastic coated steel components for placement within 1-1/2 inches (38 mm) of weathering surfaces.

2.3 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal; Type II - Moderate; Type III - High Early Strength. Portland type.

B. Fine and Coarse Aggregates: ASTM C33/C33M.

C. Fly Ash: ASTM C618, Class C or F.

D. Calcined Pozzolan: ASTM C618, Class N.

E. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

F. Structural Fiber Reinforcement: ASTM C1116/C1116M.

1. Fiber Type: Alkali-resistant synthetic.

G. Blended Fiber Reinforcement: ASTM C1116/C1116M, engineered blend of two or more sizes of reinforcing fibers.

1. Fiber Type: Alkali-resistant synthetic.

2.4 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Air Entrainment Admixture: ASTM C260/C260M.

C. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.
D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
E. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
F. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
G. Accelerating Admixture: ASTM C494/C494M Type C.
H. Retarding Admixture: ASTM C494/C494M Type B.
I. Water Reducing Admixture: ASTM C494/C494M Type A.
J. Shrinkage Reducing Admixture:

2.5 ACCESSORY MATERIALS

A. Underslab Vapor Retarder: Sheet material complying with ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
   1. Basis of Design: Stego Vapor Barrier Wrap, 15 mil; www.stegoindustries.com
B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

2.6 BONDING AND JOINTING PRODUCTS

A. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches (150 mm) on center; ribbed steel stakes for setting.

2.7 CURING MATERIALS

A. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.
B. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.
C. Curing Agent, Water Replacement Type: Clear, water based, liquid water cure replacement agent complying with ASTM C309 standards for water retention, and with ACI 302.1R.
D. Curing and Sealing Compound, Moisture Emission Reducing: Liquid, membrane-forming, clear sealer, for application to newly placed concrete; capable of providing adequate bond for flooring adhesives, initially and over the long term; with sufficient moisture vapor impermeability to prevent deterioration of flooring adhesives due to moisture emission.

2.8 **CONCRETE MIX DESIGN**

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.

C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.

D. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard (0.89 kg per cubic meter), or as recommended by manufacturer for specific project conditions.

E. Normal Weight Concrete:

1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.
2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.

PART 3 EXECUTION

3.1 **PREPARATION**

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Prepare existing concrete surfaces to be repaired according to ICRI 310.2R.

C. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.

3.2 **INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS**

A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

3.3 **PLACING CONCRETE**

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.4 **FLOOR FLATNESS AND LEVELNESS TOLERANCES**

A. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:

1. Exposed to View and Foot Traffic: F(F) of 20; F(L) of 15At slab on grade and elevated slab.

B. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155 (ASTM E1155M), within 48 hours after slab installation; report both composite overall values and local values for each measured section.

C. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.

D. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.5 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:

1. “Broom Finish" as described in ACI 302.1R.

3.6 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

END OF SECTION

SECTION 04 2000
UNIT MASONRY

PART 1 GENERAL

1.1 SUBMITTALS

A. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar and masonry accessories.

B. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

C. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.

D. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 01 6000 - Product Requirements, for additional provisions.

1.2 QUALITY ASSURANCE

A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.

1.3 MOCK-UP

A. Construct a masonry wall as a mock-up panel sized 8 feet (2.4 m) long by 6 feet (1.8 m) high; include mortar, accessories and flashings (with lap joint, corner, and end dam) in mock-up.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

PART 2 PRODUCTS

2.1 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:

1. Size: Standard units with nominal face dimensions of 16 by 8 inches (400 by 200 mm) and nominal depth of 8 inches (200 mm).
2. Special Shapes: Provide non-standard blocks configured for corners.
3. Load-Bearing Units: ASTM C90, normal weight.
    a. Both hollow and solid block, as indicated.
    b. Exposed Faces: Manufacturer's standard color and texture where indicated.
        1. Match existing colors.
4. Non-Loadbearing Units: ASTM C129.
    a. Hollow block, as indicated.

b. Match existing colors.

2.2 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C91/C91M, Type N.

B. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.

C. Hydrated Lime: ASTM C207, Type S.

D. Mortar Aggregate: ASTM C144.

E. Grout Aggregate: ASTM C404.

F. Water: Clean and potable.

G. Accelerating Admixture: Nonchloride type for use in cold weather.

H. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity.

I. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C1714/C1714M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.

1. Type: Type N.
2. Color: Standard gray.

2.3 REINFORCEMENT AND ANCHORAGE

A. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi) (280 MPa), deformed billet bars; galvanized.

B. Single Wythe Joint Reinforcement: ASTM A951/A951M.

1. Type: Truss or ladder.
2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
3. Size: 0.1483 inch (3.8 mm) side rods with 0.1483 inch (3.8 mm) cross rods; width as required to provide not less than 5/8 inch (16 mm) of mortar coverage on each exposure.

C. Single Wythe Joint Reinforcement: Truss type; ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M, Class 3; 0.1483 inch (3.8 mm) side rods with 0.1483 inch (3.8 mm) cross rods; width as required to provide not more than 1 inch (25 mm) and not less than 1/2 inch (13 mm) of mortar coverage on each exposure.

2.4 FLASHINGS

A. Metal Flashing Materials:

1. Stainless Steel Flashing: ASTM A666, Type 304, soft temper; 26 gage, 0.0187 inch (0.48 mm) thick; finish 2B to 2D.

B. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.

C. Drip Edge: Stainless steel; angled drip with hemmed edge; compatible with membrane and adhesives.

D. Lap Sealants and Tapes: As recommended by flashing manufacturer; compatible with membrane and adhesives.

2.5 **ACCESSORIES**

A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.

B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; in maximum lengths available.

2.6 **MORTAR AND GROUT MIXING**

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.

1. Exterior, non-loadbearing masonry: Type N.
2. Interior, loadbearing masonry: Type N.

B. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches (50 mm) or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches (50 mm).

C. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.1 **COLD AND HOT WEATHER REQUIREMENTS**

A. Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

3.2 **COURSING**

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:

1. Bond: Running.
2. Coursing: One unit and one mortar joint to equal 8 inches (200 mm).
3. Mortar Joints: Concave.

3.3 **PLACING AND BONDING**

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

3.4 **REINFORCEMENT AND ANCHORAGE - GENERAL AND SINGLE WYTHE MASONRY**

A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches (400 mm) on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Embed longitudinal wires of joint reinforcement in mortar joint with at least 5/8 inch (16 mm) mortar cover on each side.

E. Lap joint reinforcement ends minimum 6 inches (150 mm).

F. Embed ties and anchors in mortar joint and extend into masonry unit a minimum of 1-1/2 inches (38 mm) with at least 5/8 inch (16 mm) mortar cover to the outside face of the anchor.

3.5 **MASONRY FLASHINGS**

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.

3.6 **LINTELS**

A. Install loose steel lintels over openings.

B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.

3.7 **GROUTED COMPONENTS**

A. Place and consolidate grout fill without displacing reinforcing.

B. At bearing locations, fill masonry cores with grout for a minimum 12 inches (300 mm) either side of opening.

END OF SECTION

SECTION 06 1000
ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUBMITTALS

A. Product Data: Provide technical data on wood preservative materials and application instructions.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Douglas Fir-Larch, unless otherwise indicated.
   2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timber is not permitted.

C. Provide sustainably harvested wood; see Section 01 6000 - Product Requirements for requirements.

2.2 DIMENSION LUMBER

A. Grading Agency: Western Wood Products Association; WWPA G-5.

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.3 CONSTRUCTION PANELS

A. Other Applications:
   1. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
   2. Other Locations: PS 1, C-D Plugged or better.

2.4 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

2.5 **FACTORY WOOD TREATMENT**

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

PART 3 EXECUTION

3.1 **INSTALLATION - GENERAL**

A. Select material sizes to minimize waste.

B. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.2 **INSTALLATION OF CONSTRUCTION PANELS**

A. Roof Sheathing: Secure with long dimension perpendicular to trusses, with ends over firm bearing and staggered, using nails, screws or staples.

END OF SECTION

SECTION 06 1753
SHOP-FABRICATED WOOD TRUSSES

PART 1 GENERAL

1.1 SUBMITTALS

A. Shop Drawings: Show truss configurations, sizes, spacing, size and type of plate connectors, cambers, framed openings, bearing and anchor details, and bridging and bracing.

PART 2 PRODUCTS

2.1 TRUSSES

A. Wood Trusses: Designed and fabricated in accordance with TPI 1 and TPI DSB-89 to achieve structural requirements indicated.

2.2 MATERIALS

A. Lumber:
   1. Moisture Content: Between 7 and 9 percent.
   2. Lumber fabricated from old growth timber is not permitted.

2.3 ACCESSORIES

A. Wood Blocking, Bridging, Plates, and Miscellaneous Framing: Softwood lumber, any species, construction grade, 19 percent maximum and 7 percent minimum moisture content.

B. Fasteners: Electrogalvanized steel, type to suit application.

2.4 WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

B. Preservative Pressure Treatment of Lumber: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention (to 4.0 kg/cu m retention).

PART 3 EXECUTION

3.1 ERECTION

A. Install trusses in accordance with manufacturer's instructions and TPI DSB-89 and TPI BCSI 1; maintain a copy of each TPI document on site until installation is complete.

B. Set members level and plumb, in correct position.

3.2 SITE APPLIED WOOD TREATMENT

A. Treat all site-sawn cuts of pressure-treated wood using same type of treatment (i.e. preservative or fire-retardant).

B. Apply preservative treatment to non-pressure-treated wood wherever it will come into contact with cementitious materials, roofing, asphaltic materials, or metals.

END OF SECTION

SECTION 07 1113
BITUMINOUS DAMPPROOFING

PART 1 GENERAL

1.1 SUBMITTALS

A. Product Data: Provide properties of primer, bitumen, and mastics.

1.2 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F (5 degrees C) for 24 hours before and during application until dampproofing has cured.

PART 2 PRODUCTS

2.1 BITUMINOUS DAMPPROOFING

A. Bituminous Dampproofing: Cold-applied, spray-grade; asphalt base, volatile petroleum solvents, and other content, suitable for application by spray, brush, roller, or squeegee; asbestos-free; suitable for application on vertical and horizontal surfaces.
   1. Composition: ASTM D4479/D4479M Type I, minimum, asbestos free.
   2. VOC Content: Not more than permitted by local, State, and federal regulations.
   3. Applied Thickness: 1/16 inch (1.5 mm), minimum, wet film.

B. Primers, Mastics, and Related Materials: Type as recommended by dampproofing manufacturer.

PART 3 EXECUTION

3.1 APPLICATION

A. Foundation Walls: Apply two coats of asphalt dampproofing.

B. Perform this work in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.

C. Apply from 2 inches (50 mm) below finish grade elevation down to top of footings.

END OF SECTION

SECTION 07 4113
METAL ROOF PANELS

PART 1 GENERAL

1.1 SUBMITTALS

A. Shop Drawings: Include layouts of roof panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.

B. Selection Samples: For each roofing system specified, submit color chips representing manufacturer's full range of available colors and patterns.

C. Verification Samples: For each roofing system specified, submit samples of minimum size 12 inches (305 mm) square, representing actual roofing metal, thickness, profile, color, and texture.

1.2 WARRANTY

A. Finish Warranty: Provide manufacturer's special warranty covering failure of factory-applied exterior finish on metal roof panels and agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of five years from Date of Substantial Completion.

B. Waterproofing Warranty: Provide manufacturer's warranty for weathertightness of roofing system, including agreement to repair or replace roofing that fails to keep out water within specified warranty period of five years from Date of Substantial Completion.

C. General Contractor's Warranty: Provide General Contractor's warranty for weathertightness of roofing system, including agreement to repair or replace roofing that fails to keep out water and snow within specified warranty period of 2 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 ARCHITECTURAL METAL ROOF PANELS

A. Architectural Metal Roofing: Provide complete engineered system complying with specified requirements and capable of remaining weathertight while withstanding anticipated movement of substrate and thermally induced movement of roofing system.

B. Metal Panels: Factory-formed panels with factory-applied finish.

1. Steel Panels:

a. Zinc-coated steel complying with ASTM A653/A653M; minimum G60 (Z180) galvanizing.

b. Steel Thickness: Minimum 24 gage (0.024 inch) (0.61 mm).

2. Profile: Standing seam, with minimum 1.0 inch (25 mm) seam height; concealed fastener system for field seaming with special tool. Match existing.
3. Texture: Smooth.
4. Length: Full length of roof slope, without lapped horizontal joints.
5. Width: Maximum panel coverage of 16 inches (406 mm).

2.2 **ATTACHMENT SYSTEM**

A. Concealed System: Provide manufacturer's standard stainless steel or nylon-coated aluminum concealed anchor clips designed for specific roofing system and engineered to meet performance requirements, including anticipated thermal movement.

2.3 **FINISHES**

A. Fluoropolymer Coil Coating System: Polyvinylidene fluoride (PVDF) multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent PVDF resin, and at least 80 percent of coil coated aluminum surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch (0.023 mm); color and gloss as selected by Architect from manufacturer’s standard line.

2.4 **ACCESSORIES**

A. Underlayment: Synthetic non-asphaltic sheet, intended by manufacturer for mechanically fastened roofing underlayment without sealed seams.

PART 3 EXECUTION

3.1 **INSTALLATION**

A. Overall: Install roofing system in accordance with approved shop drawings and panel manufacturer's instructions and recommendations, as applicable to specific project conditions. Anchor all components of roofing system securely in place while allowing for thermal and structural movement.

B. Accessories: Install all components required for a complete roofing assembly, including flashings, gutters, downspouts, trim, moldings, closure strips, caps, equipment curbs, rib closures, ridge closures and similar roof accessory items.

END OF SECTION

SECTION 07 4213
METAL WALL PANELS

PART 1 GENERAL

1.1 SUBMITTALS

A. Shop Drawings: Indicate dimensions, layout, joints, construction details, methods of anchorage.

B. Samples: Submit two samples of wall panel, 12 inch (304.8 mm) by 36 inch (914 mm) in size illustrating finish color, sheen, and texture.

1.2 WARRANTY

A. Correct defective work within a five year period after Date of Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.

B. Correct defective work within a five year period after Date of Substantial Completion, including defects in water tightness and integrity of seals for metal wall panels.

PART 2 PRODUCTS

2.1 MANUFACTURED METAL PANELS

A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.

1. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.
2. Maximum Allowable Deflection of Panel: L/180 for length(L) of span.
3. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
4. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
5. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
6. Corners: Factory-fabricated in one continuous piece with minimum 2 inch (51 mm) returns.
7. Exterior Finish: Panel manufacturer's standard polyvinylidene fluoride (PVDF) coating, top coat over primer.
8. Custom Fluoropolymer Coating System: Polyvinylidene fluoride (PVDF) multi-coat thermoplastic fluoropolymer coating system, including

minimum 70 percent PVDF color topcoat and minimum total dry film thickness of 0.9 mil (0.023 mm); color and gloss as indicated on drawings.

B. Exterior Panels - Gable end wall:
   1. Material: Precoated steel sheet, 18 gage, 0.0478 inch (1.21 mm) minimum thickness.
   2. Panel Width: 16 inches (406.4 mm).
   3. Panel Depth: 1 inch.
   4. Texture: Smooth
   5. Color: To match existing.

C. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.

D. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

E. Anchors: Galvanized steel.

2.2 MATERIALS

A. Precoated Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Structural Steel (SS) or Forming Steel (FS), with G90/Z275 coating; continuous coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

2.3 FINISHES

A. Fluoropolymer Coil Coating System: Manufacturer's standard multi-coat aluminum coil coating system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of coil coated aluminum surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch (0.023 mm); color and gloss to match sample.

2.4 ACCESSORIES

A. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.

B. Concealed Sealants: Non-curing butyl sealant or tape sealant.

C. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.

D. Sealants:
   1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
   2. Concealed Sealant: Non-curing butyl sealant or tape sealant.
   3. Seam Sealant: Factory-applied, non-skinning, non-drying type.

E. Fasteners: Manufacturer's standard type to suit application; steel, hot dip galvanized.

1. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws.

F. Field Touch-up Paint: As recommended by panel manufacturer.

G. Bituminous Paint: Asphalt base.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install panels on gable trusses in accordance with manufacturer's instructions.

B. Fasten panels to structural supports; aligned, level, and plumb.

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SUBMITTALS

A. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.2 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

PART 2 PRODUCTS

2.1 SHEET MATERIALS

A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239) inch (0.61 mm) thick base metal, shop pre-coated with PVDF coating.
   1. Modified Silicone Polyester Coating: Pigmented Organic Coating System, AAMA 2603; baked enamel finish system.
   2. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
   3. Color: As selected by Architect from manufacturer's standard colors.

2.2 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.
B. Slip Sheet: 45 mil thickness EPDM under equipment pads.
C. Primer: Zinc chromate type.
D. Protective Backing Paint: Zinc molybdate alkyd.
E. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.
F. Sealant to be Exposed in Completed Work: ASTM C920; elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear.
G. Plastic Cement: ASTM D4586, Type I.
H. Reglets: Recessed type, galvanized steel; face and ends covered with plastic tape.

2.3 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
B. Form pieces in longest possible lengths.
C. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

2.4 GUTTER AND DOWNSPOUT FABRICATION

A. Gutters: SMACNA (ASMM), Rectangular profile.

B. Downspouts: Profile as indicated.

C. Gutters and Downspouts: Size for rainfall intensity determined by a storm occurrence of 1 in 10 years in accordance with SMACNA (ASMM).

D. Accessories: Profiled to suit gutters and downspouts.

1. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
2. Gutter Supports: Brackets.
3. Downspout Supports: Brackets.

E. Splash Pads: Precast concrete type, of size and profiles indicated; minimum 3000 psi (21 MPa) at 28 days, with minimum 5 percent air entrainment.

2.5 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.

B. Primer: Zinc chromate type.

C. Protective Backing Paint: Zinc molybdate alkyd.

D. Concealed Sealants: Non-curing butyl sealant.

E. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

F. Plastic Cement: ASTM D4586/D4586M, Type I.

PART 3 EXECUTION

3.1 INSTALLATION

A. Secure flashings in place using concealed fasteners.

B. Seal metal joints watertight.

END OF SECTION

SECTION 07 7100
ROOF SPECIALTIES

PART 1 GENERAL

1.1 SUBMITTALS

A. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.

B. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.

1.2 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) details.

PART 2 PRODUCTS

2.1 COMPONENTS

A. Roof Edge Flashings: Factory fabricated to sizes required; mitered, welded corners; concealed fasteners.

1. Configuration: Fascia, cant, and edge securement for roof membrane.
2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test methods RE-1 and RE-2 to positive and negative design wind pressure as defined by applicable local building code.
3. Material: Formed steel sheet, galvanized, 24 gage, 0.024 inch (0.6 mm) thick, minimum.
4. Finish: 70 percent polyvinylidene fluoride.
5. Color: To match existing.

B. Pipe and Penetration Flashing: Base of rounded aluminum, compatible with sheet metal roof systems, and capable of accomodating pipes sized between 3/8 inch (9.5 mm) and 12 inch (305 mm).

C. Pipe Penetration Wall Seal: Seal for HVAC piping wall penetrations with wall mounted rigid plastic outlet cover and elastomeric wall seal gasket.

1. Wall Outlet Size, Stucco and Masonry Applications: 7-1/2 inch wide by 10 inch high (190.5 mm wide by 254 mm high).
2. Outlet Cover Color: To be selected by Architect from manufacturer's standard line of colors.

D. Pipe Penetration Wall Seal and Insulated Piping Protection System: Seal for HVAC piping wall penetrations with wall mounted rigid plastic outlet cover and elastomeric wall seal gasket and having mechanical line insulation with PVC protective cover.

1. Wall Outlet Size, Stucco and Masonry Applications: 7-1/2 inch wide by 10 inch high (190.5 mm wide by 254 mm high).

2. Outlet Cover Color: To be selected by Architect from manufacturer's standard line of colors.
3. PVC Insulation Cover Color: Black with full-length velcro fastener.

2.2 **FINISHES**

A. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as indicated.

PART 3 EXECUTION

3.1 **INSTALLATION**

A. Install components in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

END OF SECTION

SECTION 07 7200
ROOF ACCESSORIES

PART 1 GENERAL

1.1 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used.

1.2 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.1 NON-PENETRATING ROOFTOP SUPPORTS/ASSEMBLIES

A. Non-Penetrating Rooftop Support/Assemblies: Manufacturer-engineered and factory-fabricated, with pedestal bases that rest on top of roofing membrane, and not requiring any attachment to roof structure and not penetrating roofing assembly.

1. Design Loadings and Configurations: As required by applicable codes.
2. Height: Provide minimum clearance of 6 inches (152 mm) under supported items to top of roofing.
3. Support Spacing and Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.

B. Pipe Supports: Provide attachment fixtures complying with MSS SP-58 and as indicated.

C. Non-Penetrating Pedestals: Steel pedestals with square, round, or rectangular bases.

1. Bases: High density polypropylene.
2. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
3. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

END OF SECTION

SECTION 07 9200
JOINT SEALANTS

PART 1 GENERAL

1.1 SUBMITTALS

A. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.
   5. Substrates for which use of primer is required.
   6. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
   7. Sample product warranty.
   8. Certification by manufacturer indicating that product complies with specification requirements.
   9. SWRI Validation: Provide currently available sealant product validations as listed by SWRI (VAL) for specified sealants.

B. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

D. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.

E. Sustainable Design Documentation: For sealants and primers, submit VOC content and emissions documentation as specified in Section 01 6116.

F. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

1.2 QUALITY ASSURANCE

A. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
   1. Deliver to manufacturer sufficient samples for testing.
   2. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.

3. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

PART 2 PRODUCTS

2.1 **JOINT SEALANT APPLICATIONS**

A. Scope:

1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
    a. Wall expansion and control joints.
    b. Joints between door, window, and other frames and adjacent construction.
    c. Joints between different exposed materials.
    d. Openings below ledge angles in masonry.
    e. Other joints indicated below.
2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
    a. Joints between door, window, and other frames and adjacent construction.
    b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
        1. Exception: Such gaps and openings in gypsum board and plaster finished stud walls and suspended ceilings.
        2. Exception: Through-penetrations in sound-rated assemblies that are also fire-rated assemblies.
3. Do not seal the following types of joints.
    a. Intentional weepholes in masonry.
    b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
    c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
    d. Joints where installation of sealant is specified in another section.
    e. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use nonsag non-staining silicone sealant, unless otherwise indicated.

C. Interior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.

1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.
2. Wall and Ceiling Joints in Wet Areas: Nonsag polyurethane sealant for continuous liquid immersion.
3. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; clear.
4. In Sound-Rated Assemblies: Acrylic emulsion latex sealant.

D. Interior Wet Areas: restrooms; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets and other similar items.

2.2 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

B. Colors: As selected from manufacturer's standard line of colors.

2.3 NONSAG JOINT SEALANTS

A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.

1. Non-Staining To Porous Stone: Non-staining to light-colored masonry when tested in accordance with ASTM C1248.
2. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
3. Color: Match adjacent finished surfaces.
4. Cure Type: Single-component, neutral moisture curing.
5. Service Temperature Range: Minus 65 to 180 degrees F (Minus 54 to 82 degrees C).

B. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.

1. Color: Standard colors matching finished surfaces.

C. Hybrid Urethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.

1. Movement Capability: Plus and minus 35 percent, minimum.
2. Color: Match adjacent finished surfaces.

D. Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface.

1. Movement Capability: Plus and minus 35 percent, minimum.
2. Color: Match adjacent finished surfaces.

E. Polysulfide Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.

1. Movement Capability: Plus and minus 25 percent, minimum.
2. Color: Match adjacent finished surfaces.

F. Acrylic-Urethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; paintable; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 12-1/2 percent, minimum.
2. Color: Standard colors matching finished surfaces.

2.4 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type C - Closed Cell Polyethylene.
2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type C - Closed Cell Polyethylene.
3. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.1 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Perform acoustical sealant application work in accordance with ASTM C919.

D. Install bond breaker backing tape where backer rod cannot be used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

G. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

END OF SECTION

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SUBMITTALS

A. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

B. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

1.2 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:

1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
2. Accessibility: Comply with ICC A117.1 and ADA Standards.
3. Door Top Closures: Flush end closure channel, with top and door faces aligned.
4. Door Edge Profile: Manufacturers standard for application indicated.
5. Typical Door Face Sheets: Flush.
6. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
7. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
    a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Hollow Metal Panels: Same construction, performance, and finish as doors.

C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.2 HOLLOW METAL DOORS

A. Exterior Doors: Thermally insulated.
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 3 - Extra Heavy-duty.
      b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Core Material: Polyurethane, 1.8 lbs/cu ft minimum density.
   3. Door Thermal Resistance: R-Value of 8.7, minimum, for installed thickness of polyurethane.
   4. Door Thickness: 1-3/4 inch (44.5 mm), nominal.
   5. Weatherstripping: Refer to Section 08 7100.
   6. Door Finish: Factory primed and field finished.

2.3 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Exterior Door Frames: Full profile/continuously welded type.
   1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
   2. Frame Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.
   3. Frame Finish: Factory primed and field finished.

C. Frames Wider than 48 inches (1219 mm): Reinforce with steel channel fitted tightly into frame head, flush with top.

2.4 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.5 **ACCESSORIES**

A. Grout for Frames: Portland cement grout with maximum 4 inch (102 mm) slump for hand troweling; thinner pumpable grout is prohibited.

B. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

2.6 **FINISHES**

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 EXECUTION

3.1 **INSTALLATION**

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Coordinate frame anchor placement with wall construction.

END OF SECTION

SECTION 08 7100
DOOR HARDWARE

PART 1 GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; attendance is required by affected installers and the following:
   1. Hardware Installer.
   2. Owner's Security Consultant.

B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

C. Keying Requirements Meeting:
   1. Owner will schedule meeting at project site prior to Contractor occupancy.
   2. Attendance Required:
      a. Contractor.
      b. Owner.
      c. Hardware Installer.
   3. Agenda:
      a. Establish keying requirements.
      b. Verify locksets and locking hardware are functionally correct for project requirements.
      c. Verify that keying and programming complies with project requirements.
      d. Establish keying submittal schedule and update requirements.
   4. Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:
      a. Access control requirements.
      b. Key control system requirements.
      c. Schematic diagram of preliminary key system.
      d. Flow of traffic and extent of security required.

1.2 SUBMITTALS

A. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.

B. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.

1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
2. Comply with DHI (H&S) using door numbers and hardware set numbers as indicated in construction documents.
3. List groups and suffixes in proper sequence.
4. Provide complete description for each door listed.
5. Provide manufacturer's and product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
6. Include account of abbreviations and symbols used in schedule.

C. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
1. Submit manufacturer's parts lists and templates.

D. Keying Schedule:
1. Submit three (3) copies of Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.

1.3 **WARRANTY**

A. Warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion.
1. Closers: Five years, minimum.
2. Exit Devices: Three years, minimum.
3. Locksets and Cylinders: Three years, minimum.
4. Other Hardware: Two years, minimum.

PART 2 PRODUCTS

2.1 **DESIGN AND PERFORMANCE CRITERIA**

A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.

B. Provide door hardware products that comply with the following requirements:
1. Applicable provisions of federal, state and local codes.

C. Fasteners:
1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.

2.2 **HINGES**

A. Hinges: Comply with BHMA A156.1, Grade 1.
1. Provide hinges on every swinging door.
2. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
3. Provide ball-bearing hinges at each door with closer.
4. Provide following quantity of butt hinges for each door:
a. Doors up to 60 inches (1.5 m) High: Two hinges.

b. Doors From 60 inches (1.5 m) High up to 90 inches (2.3 m) High: Three hinges.
c. Doors 90 inches (2.3 m) High up to 120 inches (3 m) High: Four hinges.

2.3 FLUSH BOLTS

A. Flush Bolts: Comply with BHMA A156.16, Grade 1.
1. Flush Bolt Throw: 3/4 inch (19 mm), minimum.
2. Provide dustproof floor strike for bolt into floor, except at metal thresholds.
3. Manual Flush Bolts: Provide lever extensions for top bolt at over-sized doors.

2.4 LOCK CYLINDERS

A. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
1. Provide standard, electronic, conventional, full size interchangeable core (FSIC) and small format interchangeable core (SFIC) type cylinders, Grade 1, with six-pin core in compliance with BHMA A156.5 at locations indicated.
2. Provide cylinders from same manufacturer as locking device.
3. Provide cams and/or tailpieces as required for locking devices.

2.5 CYLINDRICAL LOCKS

A. Cylindrical Locks (Bored): Comply with BHMA A156.2, Grade 1, 4000 Series.
1. Bored Hole: 2-1/8 inch (54 mm) diameter.
2. Latchbolt Throw: 1/2 inch (12.7 mm), minimum.
3. Backset: 2-3/4 inch (70 mm) unless otherwise indicated.
4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
a. Finish: To match lock or latch.
5. Provide a lock for each door, unless otherwise indicated that lock is not required.
6. Trim: Provide lever handle or pull trim on outside of each lock, unless otherwise indicated.

2.6 COORDINATORS

A. Coordinators: Provide on doors having closers to ensure that inactive door leaf closes before active door leaf.
1. Type: Bar, unless otherwise indicated.
2. Material: Aluminum, unless otherwise indicated.

3. Ensure that coordination of other door hardware affected by placement of coordinators and carry bar is applied properly for completely operable installation.

2.7 **CLOSERS**

A. Closers: Comply with BHMA A156.4, Grade 1.
1. Type: Surface mounted to door.
2. Provide door closer on each exterior door.

2.8 **KICK PLATES**

A. Kick Plates: Provide along bottom edge of push side of every door with closer, except aluminum storefront and glass entry doors, unless otherwise indicated.
1. Size: 36 inch (914 mm) high by 36 inch (914 mm) less door width (LDW) on push side of door.

2.9 **WALL STOPS**

A. Wall Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
1. Provide wall stops to prevent damage to wall surface upon opening door.
2. Type: Bumper, concave, wall stop.
3. Material: Aluminum housing with rubber insert.

2.10 **ASTRAGALS**

A. Astragals: Comply with BHMA A156.22.
1. Provide surface mounted astragal to cover or fill space for full door height between pair of doors or door and adjacent jamb.
2. Type: Split, two parts, and with sealing gasket.
3. Material: Aluminum, with neoprene weatherstripping.

2.11 **WEATHERSTRIPPING AND GASKETING**

A. Weatherstripping and Gasketing: Comply with BHMA A156.22.
1. Head and Jamb Type: Adjustable.
2. Material: Aluminum, with brush weatherstripping.

2.12 **FINISHES**

A. Finishes: Provide door hardware of same finish, unless otherwise indicated.
1. Primary Finish: 626; satin chromium plated over nickel, with brass or bronze base material (former US equivalent US26D); BHMA A156.18.

PART 3 EXECUTION

3.1 **INSTALLATION**

A. Install hardware in accordance with manufacturer's instructions and applicable codes.
B. Install hardware for smoke and draft control doors in accordance with NFPA 105.
C. Use templates provided by hardware item manufacturer.

D. Do not install surface mounted items until application of finishes to substrate are fully completed.

3.2 **ADJUSTING**

A. Adjust hardware for smooth operation.

END OF SECTION

SECTION 09 9113
EXTERIOR PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Exposed surfaces of steel lintels and ledge angles.

B. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Non-metallic roofing and flashing.
   5. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, zinc, and lead.
   6. Floors, unless specifically indicated.
   7. Concealed pipes, ducts, and conduits.

1.2 SUBMITTALS

A. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

B. Samples: Submit two paper chip samples, 2 by 4 inch (51 by 102 mm) in size illustrating range of colors available for each surface finishing product scheduled.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Provide paints and finishes from the same manufacturer to the greatest extent possible.

2.2 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready mixed, unless required to be a field-catalyzed paint.
   1. Where MPI paint numbers are specified, provide products listed in Master Painters Institute Approved Product List, current edition available at www.paintinfo.com, for specified MPI categories, except as otherwise indicated.

2. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
3. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
4. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
5. Supply each paint material in quantity required to complete entire project's work from a single production run.
6. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Colors: Match existing as selected from manufacturer's standard colors.
1. Allow for minimum of two colors for each system, unless otherwise indicated, without additional cost to Contractor.
2. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.3 **PAINT SYSTEMS - EXTERIOR**

A. Paint E-OP - Exterior Surfaces to be Painted, Unless Otherwise Indicated: Including primed metal.
1. Two top coats and one coat primer.
2. Top Coat(s): Exterior Alkyd Enamel; MPI #94 or 96.
3. Top Coat Sheen:
a. Satin: MPI gloss level 4; use this sheen at all locations.

B. Paint ME-OP-2A - Ferrous Metals, Primed, Alkyd, 2 Coat:
1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.

2.4 **PRIMERS**

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.
1. Rust-Inhibitive Water Based Primer; MPI #107.

PART 3 EXECUTION

3.1 **EXAMINATION**

A. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
1. Masonry, Concrete, and Concrete Masonry Units: 12 percent.

2. Concrete Floors and Traffic Surfaces: 8 percent.

3.2 **PREPARATION**

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 **APPLICATION**

A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

END OF SECTION

SECTION 09 9123
INTERIOR PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Mechanical and Electrical:
      a. In finished areas, paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment and electrical equipment, unless otherwise indicated.
      b. In finished areas, paint shop-primed items.

B. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
   5. Floors, unless specifically indicated.
   6. Glass.
   7. Concealed pipes, ducts, and conduits.

1.2 SUBMITTALS

A. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

B. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Provide paints and finishes from the same manufacturer to the greatest extent possible.

2.2 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
   1. Where MPI paint numbers are specified, provide products listed in Master Painters Institute Approved Product List, current edition available at www.paintinfo.com, for specified MPI categories, except as otherwise indicated.
   2. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   3. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   4. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
   5. Supply each paint material in quantity required to complete entire project's work from a single production run.
   6. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Colors: To be selected from manufacturer's full range of available colors.
   1. Allow for minimum of two colors for each system, unless otherwise indicated, without additional cost to Montana Department of Transportation.
   2. Extend colors to surface edges; colors may change at any edge as directed by Architect.
   3. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.
   4. In utility areas, finish equipment, piping, conduit, and exposed duct work in colors according to the color coding scheme indicated.

2.3 PAINT SYSTEMS - INTERIOR

A. Paint I-OP - Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board, uncoated steel and shop primed steel.
   1. Two top coats and one coat primer.

2. Top Coat(s): Institutional Low Odor/VOC Interior Latex; MPI #143, 144, 145, 146, 147, or 148.
3. Top Coat Sheen:
   a. Satin: MPI gloss level 4; use this sheen at all locations.
4. Primer: As recommended by top coat manufacturer for specific substrate.

B. Paint I-OP-MD-DT - Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals:
1. Two top coats and one coat primer.
2. Top Coat(s): Interior Light Industrial Coating, Water Based; MPI #151, 153 or 154.
3. Top Coat Sheen:
   a. Satin: MPI gloss level 4; use this sheen at all locations.
4. Primer: As recommended by top coat manufacturer for specific substrate.

C. Paint I-OP-MD-WC - Medium Duty Vertical and Overhead: Including concrete masonry units.
1. Two top coats and one coat primer.
2. Top Coat(s): Institutional Low Odor/VOC Interior Latex; MPI #143, 144, 145, 146, 147, or 148.
3. Top Coat Sheen:
   a. Satin: MPI gloss level 4; use this sheen at all locations.

2.4 **PRIMERS**

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.
1. Interior Institutional Low Odor/VOC Primer Sealer; MPI #149.

PART 3 EXECUTION

3.1 **EXAMINATION**

A. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
1. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
2. Concrete Floors and Traffic Surfaces: 8 percent.

3.2 **PREPARATION**

A. Clean surfaces thoroughly and correct defects prior to application.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 **APPLICATION**

A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

END OF SECTION

SECTION 10 1400
SIGNAGE

PART 1 GENERAL

1.1 SUBMITTALS

A. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.

B. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.

C. Samples: Submit one sampleof each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

D. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.

E. Verification Samples: Submit samples showing colors specified.

PART 2 PRODUCTS

2.1 SIGNAGE APPLICATIONS

A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.

1. Sign Type: Flat signs with engraved panel media as specified.
2. Provide "tactile" signage, with letters raised minimum 1/32 inch (0.8 mm) and Grade II braille.
3. Character Height: 1 inch (25 mm).
4. Sign Height: 8 inches (203 mm), unless otherwise indicated.

2.2 SIGN TYPES

A. Flat Signs: Signage media without frame.

1. Edges: Square.
2. Corners: Square.
3. Wall Mounting of One-Sided Signs: Tape adhesive.

B. Color and Font: Unless otherwise indicated:

1. Character Font: Helvetica, Arial, or other sans serif font.
2. Character Case: Upper case only.
3. Background Color: Clear.
4. Character Color: Contrasting color.

2.3 **ACCESSORIES**

A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.

B. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.1 **INSTALLATION**

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

END OF SECTION

SECTION 10 4400
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.1 SUBMITTALS

A. Product Data: Provide extinguisher operational features, extinguisher ratings and classifications, color and finish and installation instructions.

B. Shop Drawings: Indicate locations of cabinets, cabinet physical dimensions, rough-in measurements for recessed cabinets and installation procedures.

PART 2 PRODUCTS

2.1 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.

1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.

B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.

1. Cartridge Operated: Spun shell.
2. Class: A:B:C type.
3. Size: 10 pound (4.54 kg).
4. Finish: Baked polyester powder coat, red color.

2.2 ACCESSORIES

A. Extinguisher Brackets: Formed steel, galvanized and enamel finished.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Secure rigidly in place.

END OF SECTION

SK GEOTECHNICAL

Descriptive Terminology

Standard D 2487
Classification of Soils for Engineering Purposes
(Unified Soil Classification System)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines [C]	$C_U \geq 4$ and $1 \leq C_C \leq 3$ [E]	GW	Well graded gravel [F]
			$C_U < 4$ and/or $1 > C_C > 3$ [E]	GP	Poorly graded gravel [F]
		Gravels with Fines More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines [D]	$C_U \geq 6$ and $1 \leq C_C \leq 3$ [E]	SW	Well graded sand [I]
			$C_U < 6$ and/or $1 > C_C > 3$ [E]	SP	Poorly graded sand [I]
		Sands with Fines More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid Limit less than 50	Inorganic	PI > 7 and plots on or above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic	Liquid limit – oven dried / Liquid limit – not dried < 0.75	OL	Organic clay [K, L, M, N] / Organic silt [K, L, M, O]
	Silts and Clays Liquid limit 50 or more	Inorganic	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic	Liquid limit – oven dried / Liquid limit – not dried < 0.75	OH	Organic clay [K, L, M, P] / Organic silt [K, L, M, Q]
Highly Organic Soils		Primarily organic matter, dark in color, and organic odor		PT	Peat

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

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

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

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

[E] $C_U = D_{50} / D_{10}$
$C_C = (D_{30})^2 / (D_{10} \times D_{50})$

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

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

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

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

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

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

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

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

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

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

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

[Q] PI plots below "A" line.

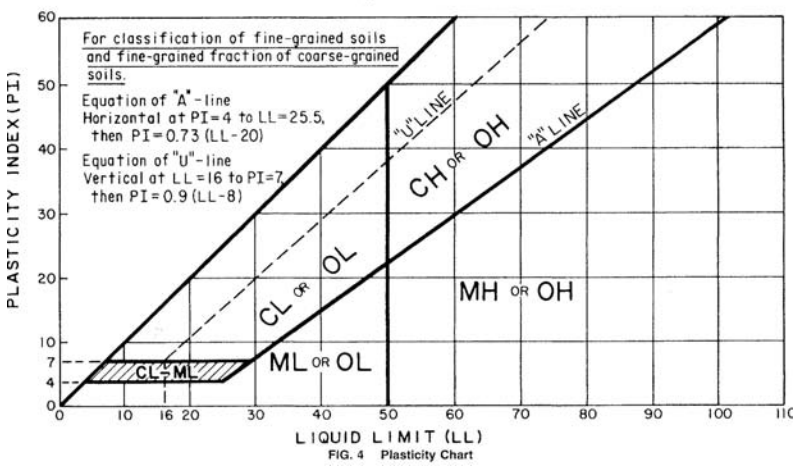


FIG. 4 Plasticity Chart

Laboratory Tests

DD	Dry density, pcf	OC	Organic content, %
WD	Wet density, pcf	P_{200}	% passing 200 sieve
LL	Liquid limit	PL	Plastic limit
PI	Plasticity index	MC	Natural moisture content, %
qu	Unconfined compressive strength, psf		
qp	Pocket penetrometer strength, tsf		

Particle Size Identification

Boulders	over 12"
Cobbles	3" to 12"
Gravel	
coarse	3/4" to 3"
fine	No. 4 to 3/4"
Sand	
coarse	No. 4 to No. 10
medium	No. 10 to No. 40
fine	No. 40 to No. 200
Silt	No. 200 to .005 mm
Clay	less than .005 mm

Relative Density of Cohesionless Soils

very loose	0 to 4 BPF
loose	5 to 10 BPF
medium dense	11 to 30 BPF
dense	31 to 50 BPF
very dense	over 50 BPF

Consistency of Cohesive Soils

very soft	0 to 1 BPF
soft	2 to 3 BPF
rather soft	4 to 5 BPF
medium	6 to 8 BPF
rather stiff	9 to 12 BPF
stiff	13 to 16 BPF
very stiff	17 to 30 BPF
hard	over 30 BPF

Moisture Content (MC) Description

rather dry	MC less than 5%, absence of moisture, dusty
moist	MC below optimum, but no visible water
wet	MC over optimum, visible free water, typically below water table
saturated	Clay soils were MC over optimum

Drilling Notes

Standard penetration test borings were advanced by 3¼" or 4¼" ID hollow-stem augers, unless noted otherwise. Standard penetration test borings are designated by the prefix "ST" (split tube). Hand auger borings were advanced manually with a 2 to 3" diameter auger to the depths indicated. Hand auger borings are indicated by the prefix "HA."

Sampling. All samples were taken with the standard 2" OD split-tube sampler, except where noted. TW indicates thin-walled tube sample. CS indicates California tube sample.

BPF. Numbers indicate blows per foot recorded in standard penetration test, also known as "N" value. The sampler was set 6" into undisturbed soil below the hollow-stem auger. Driving resistances were then counted for second and third 6" increments and added to get BPF. Where they differed significantly, they were separated by backslash (/). In very dense/hard strata, the depth driven in 50 blows is indicated.

WH. WH indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

Note. All tests were run in general accordance with applicable ASTM standards.

SK GEOTECHNICAL
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LOG OF BORING

Project Name: Dena Mora Rest Area - Wastewater Treatment Retrofit		Project Number: 11-2822S	
Borehole Location: See attached sketch.		Borehole Number: ST-3	Sheet 1 of 1
Drilling Equipment: CME 75	Hammer Type: Automatic	Driller: J. Falcon	Logger: K. Dansie
Drilling Fluid: None	Borehole Diameter (in): 8	Date Started: 9/1/2011	Date Finished: 9/1/2011

Elevation and Datum: Ground: 3706.3 Casing:

Notes:

DEPTH (feet)	OPERATION	PRESSURE (psi)	RATE (fph)	CORE PERCENT RECOVERY	ROCK QUALITY DESIGNATION (RQD)	SAMPLE	SAMPLE RECOVERY	STANDARD PENETRATION TEST SPT	UNIT WEIGHT (pcf)	MOISTURE CONTENT (%)	LIQUID LIMIT LL	PLASTIC LIMIT PL	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH (feet)	REMARKS
	DRILL						8"	7/8/9		4				2" topsoil/root zone over SILTY SAND with GRAVEL, fine- to medium-grained, nonplastic, brown, dry, medium dense. (Alluvium)		
							0"	10/11/4		---				[A-2-4]	3.0	Rock in shoe.
5							10"	12/17/21		9				CLAYEY GRAVEL with SILT and SAND, fine- to coarse-grained, slightly plastic, few Cobbles, yellow-brown, FeOx stains, moist to wet, dense. (Alluvium)		
							9"	27/33/35		8				[A-1-b]	7.0	On cobble at 6'.
10							11"	17/28/35		8				CLAYEY GRAVEL with SILT, SAND, and COBBLES, fine- to coarse-grained, slightly plastic, yellow-brown, wet (waterbearing), very dense. (Alluvium)		
							8"	22/27/32		---				[A-1-b]		
15								16/18/25		12						Cobbly at 16', hard drilling.
20								18/29/16		7						Very cobbly 21' to 24'.
25								8/26/28		13					25.5	

END OF BORING

Bottom-of-hole elevation = 3680.8

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

Sampler Types: Split Spoon; Shelby; Bulk Sample; Grab Sample; Penetrometer; Vane Shear; Special Samplers; Testpit

WATER LEVEL OBSERVATIONS

While Drilling ▽ 4.9 ft Upon Completion of Drilling ▼ N/E ft

Time After Drilling

Depth To Water (feet)

Remarks: Water not observed to wet cave-in depth of 2' immediately after withdrawal of auger.

ENGLISH SAMPLE RECOVERY 2822S.GPJ MT_DOT.GDT 9/21/11

AWARD COPY

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LOG OF BORING

Project Name: Dena Mora Rest Area - Wastewater Treatment Retrofit			Project Number: 11-2822S
Borehole Location: See attached sketch.		Borehole Number: ST-4	Sheet 1 of 1
Drilling Equipment: CME 75	Hammer Type: Automatic	Driller: J. Falcon	Logger: K. Dansie
Drilling Fluid: None	Borehole Diameter (in): 8	Date Started: 9/1/2011	Date Finished: 9/1/2011

Elevation and Datum: Ground: 3707.9 Casing:

Notes:

DEPTH (feet)	DRILL: OPERATION	DRILL: PRESSURE (psi)	DRILL: RATE (fph)	CORE PERCENT RECOVERY	ROCK QUALITY DESIGNATION (RQD)	SAMPLE	SAMPLE RECOVERY	STANDARD PENETRATION TEST: SPT	UNIT WEIGHT (pcf)	MOISTURE CONTENT (%)	LIQUID LIMIT: LL	PLASTIC LIMIT: PL	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH (feet)	REMARKS
							5"	2/7/5		2				2" topsoil/root zone over SILTY SAND with GRAVEL, fine- to coarse-grained, nonplastic, yellow-brown, dry, medium dense. (Alluvium) [A-2-4]		
							3"	5/8/7		5					4.0	
5							7"	9/12/11		9				POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, nonplastic, yellow-brown, moist to wet, medium dense. (Alluvium) [A-1-a]		
							8"	18/16/30-½"		11					9.0	
10							9"	18/23/24		10				CLAYEY GRAVEL with SILT, SAND, and COBBLES, fine- to coarse-grained, slightly plastic, yellow-brown, waterbearing, dense. (Alluvium) [A-1-b] -FeOx staining.		8" heave.
							8"	8/21/23		11						
15							8"	35/19/10		15						
20							7"	10/9/16		13						
															22.5	
25							6"	9/50-4½"		19				POORLY GRADED GRAVEL with SAND, medium- to coarse-grained, nonplastic, gray, waterbearing, very dense. (Alluvium) [A-1-a]	25.0	

END OF BORING

Bottom-of-hole elevation = 3682.9

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

Sampler Types: Split Spoon; Shelby; Bulk Sample; Grab Sample; Penetrometer; Vane Shear; Special Samplers; Testpit

WATER LEVEL OBSERVATIONS

While Drilling ▽ 4.7 ft Upon Completion of Drilling ▼ N/E ft
Time After Drilling
Depth To Water (feet)
Remarks: Water not observed to wet cave-in depth of 20" immediately after withdrawal of auger.

ENGLISH SAMPLE RECOVERY 2822S.GPJ MT_DOT.GDT 9/21/11

STANDARD PROVISIONS INDEX

FEDERAL AID PROJECTS CONTAINS

Federal Wage Rates (Rev. 1-1-2021)..... 9 Pages

Requirements & Acknowledgement for Working on Railroad R/W ..... 1 Page

Required Contract Provisions Federal-Aid Const. Contracts (FORM FHWA-1273) [Rev.5-1-2012]..... 12 Pages

Supplemental Revisions for Required Contract Provisions Federal-Aid Const. Contracts (FORM FHWA-1273) [Added 2-4-2016] ..... 1 Page

EEO Affirmative Action Req. on Federal-Aid Construction ..... 1 Page

General Decision Number: MT20210079 01/01/2021

Superseded General Decision Number: MT20200079

State: Montana

Construction Type: Highway

Counties: Montana Statewide.

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.95 for calendar year 2021 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.95 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2021. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/01/2021

* SUMT2014-001 02/19/2014

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

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

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

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

CEMENT MASON/CONCRETE FINISHER...$ 24.87 10.80

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

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

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

DIVER

Diver Tender.....$ 37.16 14.52
Diving.....$ 76.32 14.52
Stand-By.....$ 38.16 14.52
The tender shall receive 2 hours at the straight time pay rate per shift for dressing and/or undressing a Diver when work is done under hyperbaric conditions.

Depth Pay (Surface Diving):

0-20 ft.: Free zone
>20-100 ft.: $2.00 per ft.
>100-150 ft.: $3.00 per ft.
>150-220 ft.: $4 00 per ft.
>220 ft.: $5.00 per ft.
Diving in Enclosures (Diver Only):

0-25 ft.: Free zone
>25-300 ft.: $1.00 per ft.

DIVER ZONE PAY:

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

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

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

ELECTRICIAN (LINE CONSTRUCTION)

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

TRAVEL PAY:

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

$60.00 per day - Over 25 Miles

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

ELECTRICIAN

All Areas.....$ 32.74 13.42

TRAVEL PAY:

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

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

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

IRONWORKER.....$ 27.25 20.98

TRAVEL PAY:

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

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

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

Zone 3: Over 50 miles - Base + $3.00

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

LABORER

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

GROUP 1: Flag Person

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

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

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

LABORERS ZONE PAY:

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

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

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

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

PAINTER ZONE PAY:

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

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

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

POWER EQUIPMENT OPERATOR:

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

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

POWER EQUIPMENT OPERATOR ZONE PAY:

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

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

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

TRUCK DRIVER

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

GROUP 1: Pilot Car

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

TRUCK DRIVER ZONE PAY:

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

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

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

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

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury, or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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

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

Union Rate Identifiers:

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

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

Survey Rate Identifiers:

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

producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

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

Union Average Rate Identifiers:

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those

classifications: however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

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

be:

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

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations.

Write to:

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

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

Write to:

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

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

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

Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

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

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END OF GENERAL DECISION

Effective 01-21-21

"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 May 1, 2012

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. General
II. Nondiscrimination
III. Nonsegregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Compliance with Governmentwide Suspension and Debarment Requirements
XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

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

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

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

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

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

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

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

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

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

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

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

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

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

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

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

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

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

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

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

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

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

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

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

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

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

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

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

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

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

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

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

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

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

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

3. Payrolls and basic records

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

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

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

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

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

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

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

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

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

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

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

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

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

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

b. Trainees (programs of the USDOL).

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

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

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

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

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

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

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

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

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

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

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

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

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

VI. SUBLETTING OR ASSIGNING THE CONTRACT

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

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;
(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

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

VII. SAFETY: ACCIDENT PREVENTION

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

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

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

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

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

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

2. **Instructions for Certification - Lower Tier Participants:**

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

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

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

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

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

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

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

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

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

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

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

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

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SPECIAL PROVISIONS
Rev. 3-15-02
EEO AFFIRMATIVE ACTION REQUIREMENTS ON
FEDERAL & FEDERAL-AID CONSTRUCTION CONTRACTS

Federal-aid contractors are hereby notified they are subject to the OFCCP goals and timetables for minority and female participation expressed below. Compliance with the goals and OFCCP affirmative action efforts for contracts and subcontracts consisting of $10,000 or more will be determined by OFCCP officials.

APPENDIX A

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

1. The Offeror's or Bidder's attention is called to the Equal Opportunity Clause and "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

GOALS FOR FEMALE PARTICIPATION EACH TRADE	6.9%
TIMETABLES	GOALS FOR MINORITY PARTICIPATION IN EACH TRADE
153 Great Falls, MT	
SMSA (Standard Metropolitan Statistical Area) Counties	
3040 Great Falls, MT	3.2%
Cascade County	
Non-SMSA Counties	4.1%
Blaine, Broadwater, Chouteau, Fergus, Glacier, Hill, Jefferson, Judith Basin, Lewis & Clark, Liberty, Meagher, Petroleum, Phillips, Pondera, Teton, Toole, Valley, Wheatland	
154 Missoula, MT	
Non-SMSA Counties	2.7%
Beaverhead, Deer Lodge, Flathead, Granite, Lincoln, Madison, Mineral, Lake Missoula, Powell, Ravalli, Sanders, Silver Bow	
155 Billings, MT	
SMSA Counties	
0880 Billings, MT	3.3%
Yellowstone County	
Non-SMSA Counties	3.3%
Big Horn, Carbon, Carter, Custer, Dawson, Fallon, Gallatin, Garfield, Golden Valley, McCone, Musselshell, Park, Powder River, Prairie, Rosebud, Stillwater, Sweet Grass, Treasure, Wibaux, Yellowstone Nat'l Park	
Non-SMSA Counties	
Daniels, Sheridan, Richland, Roosevelt	4.4%

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

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

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