

CITY OF MILLERSBURG, OREGON

for the construction of the
TRANSITION PARKWAY AND LINEAR PARK

Project No. 2022-006

VOLUME 1
SPECIFICATIONS

Bid Documents

JACOBS

Corvallis, Oregon

May 2024

This project was funded in part with a financial award from the Special Public Works Fund, funded by the Oregon State Lottery and administered by the Oregon Infrastructure Finance Authority.

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Project No. D3395316

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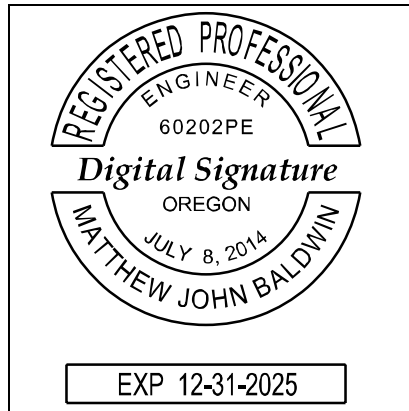
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May 16, 2024

Matthew John Baldwin

CITY OF MILLERSBURG
TRANSITION PARKWAY AND LINEAR PARK

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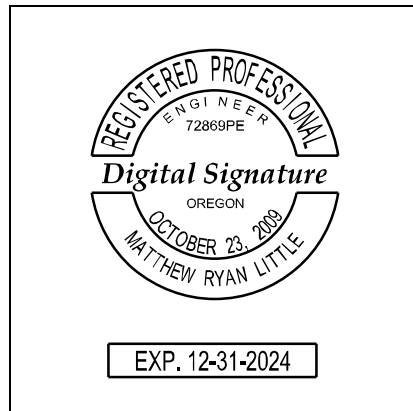
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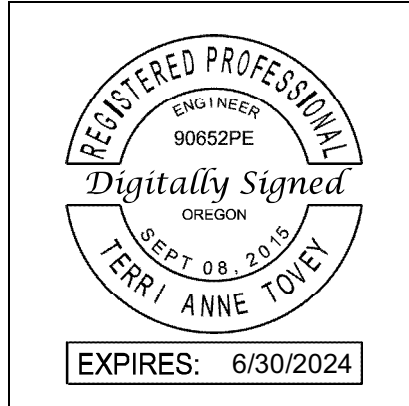


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Matthew Ryan Little

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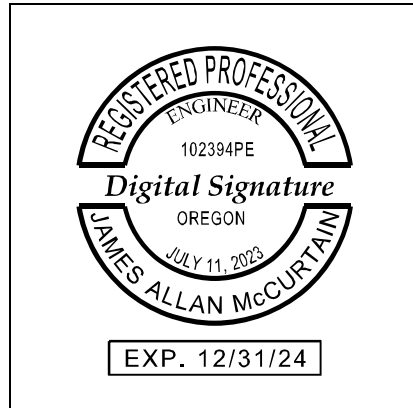
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May 16, 2024

Terri Anne Tovey

CITY OF MILLERSBURG
TRANSITION PARKWAY AND LINEAR PARK

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May 16, 2024

James Allan McCurtain

CITY OF MILLERSBURG
TRANSITION PARKWAY AND LINEAR PARK

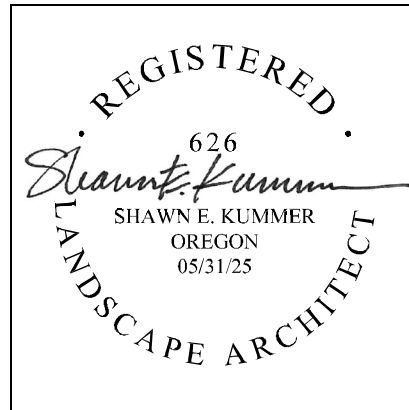
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May 16, 2024

Shawn E. Kummer

CITY OF MILLERSBURG
TRANSITION PARKWAY AND LINEAR PARK

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Donald Craig Wagner

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Paul Alan Davis

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PART 1

PROCUREMENT REQUIREMENTS

CITY OF MILLERSBURG
TRANSITION PARKWAY AND LINEAR PARK

ADVERTISEMENT FOR BIDS

Sealed Bids for construction of Transition Parkway and Linear Park, addressed to Janelle Booth, City Engineer/Asst. City Manager, 4222 Old Salem Road, Millersburg, Oregon 97231, will be received at Millersburg City Hall, City of Millersburg, State of Oregon, (Owner), until 2:00 p.m., local time, on the 27th day of June 2024. Any Bids received after the specified time will not be considered.

Bids will then be publicly opened and read at City Hall in the Council Chambers.

The Project contemplated consists of Schedules A, B and C as described below and includes erosion and sedimentation control and incidental items.

The Work will be completed in all respects on or before, as set forth below:

Schedule A and Schedule B: October 17, 2025.

Schedule C: May 29, 2026.

Bids are invited for the following separate Schedules:

- Schedule A: approximately 1,000 feet of arterial roadway, grading, potable water distribution main, stormwater piping, irrigation, landscaping approximately 4 acres of linear park, landscaping, irrigation, and sediment and erosion control.
- Schedule B: approximately 1,200 feet of potable water distribution main and sediment and erosion control.
- Schedule C: approximately 2,700 feet of arterial roadway, grading, potable water distribution main, stormwater piping, irrigation, landscaping approximately 6 acres of linear park, landscaping, irrigation, and sediment and erosion control.

Engineer's estimate for all Schedules is \$12,000,000 to \$13,500,000.

This project is funded in part with a financial award from the Special Public Works Fund, funded by the Oregon State Lottery and administered by the Oregon Infrastructure Finance Authority.

Bidders shall submit a separate and independent Bid for all of the separate Schedules contemplated under this Advertisement for Bids. All Schedules will be awarded under one contract.

CITY OF MILLERSBURG
TRANSITION PARKWAY AND LINEAR PARK

Bidding Documents may be examined in Owner's office, Millersburg City Hall, 4222 Old Salem Road, Millersburg, Oregon 97231, or at Engineer's office, Jacobs Engineering Group Inc., 1100 N.E. Circle Blvd., Suite 300, Corvallis, Oregon 97330. Full Size PDF Bidding Documents may be obtained from the Owner's website (www.millersburgoregon.gov/publicworks/page/millersburg-transition-parkway-open-bids), or hard copies may be obtained from Owner's office upon payment (check or money order only) of \$200 for each set of documents, unless otherwise noted. Return of the documents is not required, and amount paid for the documents is nonrefundable.

To be considered a Plan Holder and be notified of Addenda and responses to questions, if and when applicable, a Contractor shall register with the City of Millersburg by emailing jbooth@cityofmillersburg.org with "TRANSITION PARKWAY PLAN HOLDER REQUEST" in the subject line of the email and the email address(es) to be added to the plan holder list in the body.

The following plan room services have received sets of Bidding Documents for the Work contemplated herein:

Daily Journal of Commerce Plan Center:

Daily Journal of Commerce
Portland, Oregon
Telephone: (503) 274-0624
plancenter@djcoregon.com

Each Bid must be submitted on the prescribed Bid Form and accompanied by Bid security as prescribed in the Instructions to Bidders.

The Successful Bidder will be required to furnish the additional bond(s) and insurance prescribed in the Bidding Documents.

Prior to submission of its Bid, Bidder shall be registered with the Oregon Construction Contractors Board.

Bidders are not required to be prequalified by Owner to perform the type and size of Work contemplated herein.

Bidders shall be qualified in accordance with the applicable parts of ORS 279C.430 through ORS 279C.450 in order to submit a Bid.

In order to submit a Bid, Bidders shall comply with the requirements listed in the Instructions to Bidders.

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No Bid will be received or considered by Owner unless the Bid contains, or is accompanied by, a statement by Bidder that Bidder accepts prevailing wage rate provisions required by ORS 279C.840.

For information concerning the proposed Work, contact Matt Baldwin, Project Manager, P.E, telephone: (541) 768-3556.

For an appointment to visit the Site, contact Janelle Booth, City Engineer/Asst. City Manager, telephone: (458) 233-6300.

Owner's right is reserved to reject all Bids or any Bid not conforming to the intent and purpose of the Bidding Documents.

Dated this 30th day of May 2024.

City of Millersburg

By _____
Sheena Dickerman, City Recorder

END OF SECTION

INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS

1.1. Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

1.1.1. *Issuing Office*—The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.

1.1.2. Plan Holder—To be considered a Plan Holder and be notified of Addenda and responses to questions, if and when applicable, a Contractor shall register with the City of Millersburg by emailing jbooth@cityofmillersburg.org with “TRANSITION PARKWAY PLAN HOLDER REQUEST” in the subject line of the email and the email address(s) to be added to the plan holder list in the body. Alternately a Contractor may call City Hall and request to be added to the Plan Holder List at (458) 233-6300.

1.1.3. Bid Alternates: Specific work or materials that are not included in the Base Bid and are in lieu of materials included in the Base Bid. Price for each Bid Alternate can be either ADDITIVE or DEDUCTIVE to the Base Bid.

1.1.4. Asphalt Cement Material Price Escalation/De-escalation: An asphalt cement escalation/de-escalation clause will be in effect during the life of the Contract.

1.1.4.1. Monthly Asphalt Cement Material Price (MACMP): The MACMP will be established by ODOT each month. For information regarding the calculation of the MACMP, and for the actual MACMP, go to the ODOT website at:
<https://www.oregon.gov/odot/business/pages/asphalt-fuel-price.aspx>

1.1.4.2. If the ODOT index ceases to be available for any reason, the City in its discretion will select and begin using a substitute price source or index to establish the MACMP each month. The MACMP will apply to all asphalt cement including but not limited to paving grade, polymer modified, and emulsified asphalts, and recycling agents. The City does not guarantee that asphalt cement will be available at the MACMP.

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1.1.4.3. Base Asphalt Cement Material Price (Bases): The Base asphalt cements material price for this Project is the MACMP published on the ODOT website for the month immediately preceding the bid opening date.

1.1.4.4. Monthly Asphalt Cement Adjustment Factor: The Monthly Asphalt Cement Adjustment Factor will be determined each month as follows:

1.1.4.4.1. If the MACMP is within plus or minus 5 percent of the Base, there will be no adjustment.

1.1.4.4.2. If the MACMP is more that 105 percent of the Base, then Adjustment Factor = (MACMP)-(1.05 x Base).

1.1.4.4.3. If the MACMP is less than 95 percent of the Base, then: Adjustment Factor = (MACMP)-(0.95 x Base).

1.1.4.5. Asphalt Cement Price Adjustment: A price adjustment will be made for the items containing asphalt cement listed below. The price adjustment as calculated in 1.1.4.4 above will use the MACMP for the month the asphalt is incorporated into the Project. The price adjustment will be determined by multiplying the asphalt incorporated during the month for subject Pay Items by the Adjustment Factor.

1.1.4.5.1. The Pay Items for all Schedules for which price adjustments will be made are:

1.1.4.5.1.1. PG 64-22 Asphalt Cement in HMAC Base Course.

1.1.4.5.1.2. PG 70-22 Asphalt Cement in HMAC Wearing Course.

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1.1.5. Deferred Award Schedule C: For the Bidder that is awarded the Contract, Bid Price for Schedule C shall remain valid for a period of up to 245 days following Bid Opening. Owner may chose to exercise a Deferred Award Schedule C during this same 245 day period. For the Deferred Award Schedule C, Unit Prices for all Bid Items except Bid Items 2 and 4 will be factored at the time of Award by the Engineering News Record, Construction Cost Index 20 City Average (ENR-CCI20) in accordance with the following formula.

Factored Deferred Award Schedule C Price = Schedule C Bid Price*
[ENR-CCI20 (month prior to Bid Alternate Award)]/[ENR-CCI20 (Month of Bid Opening)].

If Owner declines to exercise Deferred Award Schedule C, Owner will not pay for any expenses or materials for Schedule C.

Owner reserves the right to Rebid Schedule C as an independent project in the future, as best serves the needs of the City of Millersburg.

1.1.6. City of Millersburg Form BC-1: Contractor shall make a good faith effort to subcontract with minority-owned, women-owned, disabled service veteran-owned and emerging small business enterprises (MWSDV-E), as described in ORS 200.045. Contractor's good faith effort shall include, at minimum: (1) identifying and selecting specific economically feasible units of the public contract that MWSDV-E firms may perform in order to increase the likelihood that they will participate in the project; and (2) pre-submission of Bid, contacting a minimum of three MWSDV-E certified firms. Contractor shall certify to Owner its good faith efforts and compliance with ORS 200.045 and ORS 200.090. City of Millersburg Form BC-1 List of Contacted Disadvantaged Business Enterprises is required to be submitted with Contractor's Bid to document these efforts for this Project. If there are less than three MWSDV-E firms within a 100 mile radius of the Project Site, the requirement for contacting MWSDV-E firms is reduced to the number available.

2. COPIES OF BIDDING DOCUMENTS

2.1. Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the Advertisement for Bids may be obtained from the Issuing Office.

2.2. Complete sets of Bidding Documents shall be used in preparing Bids. Neither Owner nor Engineer assumes responsibility for errors or misinterpretations resulting from use of incomplete sets of Bidding Documents.

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2.3. Owner and Engineer, in making copies of Bidding Documents made available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license or grant for any other use.

3. QUALIFICATIONS OF BIDDERS

3.1. In order to perform public work, Bidder and its Subcontractors, prior to award of Contract or as otherwise required by the jurisdiction, shall hold or obtain such licenses as required by State Statutes, and federal and local Laws and Regulations.

3.2. To demonstrate Bidder's qualifications to perform the Work, within 5 days of Owner's request, Bidder shall submit written evidence such as financial data, previous experience, present commitments.

3.3. Bidder is advised to carefully review those portions of the Bid Form requiring representations and certifications.

3.4. Bidder shall not be listed on the Bureau of Labor and Industries list of persons having violated prevailing wage rate laws, as described in ORS 279C.860.

3.5. Bidder shall not be disqualified from eligibility for certain public works contracts by the Oregon Construction Contractors Board, as described in ORS 701.227.

3.6. Bidder shall not be in violation of any tax laws and its license shall be in good standing with the Oregon Department of Revenue, as described in ORS 305.385.

3.7. Bidder shall have a drug-testing program as required in ORS 279C.505.

4. REGISTRATION REQUIREMENTS

4.1. In order to submit a Bid, a person, partnership, corporation, or joint venture shall have a current, valid license issued by the Oregon Construction Contractors Board, as required by ORS 701.055.

5. EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

5.1. Subsurface and Physical Conditions:

5.1.1. The Supplementary Conditions identify:

5.1.1.1. Those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site.

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5.1.1.2. Those drawings known to Owner of physical conditions relating to existing surface and subsurface structures at the Site (except Underground Facilities).

5.1.2. Copies of reports and drawings referenced will be made available by Owner to any Bidder on request. The “technical data” contained therein upon which Bidder is entitled to rely as provided in Paragraph 5.03 of the General Conditions has been identified and established in Paragraph 5.03 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any “technical data” or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings. Costs associated with making available copies of reports and drawings shall be borne by Owner.

5.2. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner or others.

5.3. Hazardous Environmental Condition:

5.3.1. The Supplementary Conditions identify reports and drawings known to Owner relating to a Hazardous Environmental Condition identified at the Site.

5.3.2. Copies of reports and drawings referenced will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the “technical data” contained therein upon which Bidder is entitled to rely as provided in Paragraph 5.06 of the General Conditions has been identified and established in Paragraph 5.06 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any “technical data” or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings. Costs associated with making available copies of reports and drawings shall be borne by Owner.

5.4. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraph 5.03 through Paragraph 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents as a result of any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or

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Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

5.5. On request, Owner will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.

5.6. Related Work at Site: Reference is made to the General Requirements for identification of the general nature of other work that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) that relates to the Work contemplated by these Bidding Documents.

5.7. It is responsibility of each Bidder before submitting a Bid to:

5.7.1. Examine and carefully study the Bidding Documents, other related data identified in the Bidding Documents, and any Addenda.

5.7.2. Visit the Site to become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

5.7.3. Become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

5.7.4. Carefully study all:

5.7.4.1. Reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in Paragraph 5.03 of the Supplementary Conditions as containing reliable "technical data."

5.7.4.2. Reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph 5.06 of the Supplementary Conditions as containing reliable "technical data."

5.7.5. Consider the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents,

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with respect to the effect of such information, observations, and documents on:

5.7.5.1. Cost, progress, and performance of the Work.

5.7.5.2. Means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents.

5.7.5.3. Bidder's safety precautions and programs.

5.7.6. Agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) Bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

5.7.7. Become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

5.7.8. Promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in Bidding Documents and confirm that written resolution thereof by Engineer is acceptable to Bidder.

5.7.9. Determine Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance of the Work.

5.8. Submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this article; that without exception the Bid is premised upon performing and furnishing the Work required by Bidding Documents and applying specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by Bidding Documents; that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder; and that Bidding Documents are generally sufficient to indicate and convey understanding of terms and conditions for performing and furnishing the Work.

6. PREBID CONFERENCE

6.1. A prebid conference will be held at 10:00 a.m. local time on June 10th, 2024 at Millersburg City Hall, 4222 Old Salem Road, Millersburg, Oregon 97321. Representatives of Owner and Engineer will be present to discuss the Project. Bidders

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are encouraged to attend and participate in the conference. Engineer will transmit to prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

7. SITE AND OTHER AREAS

7.1. The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner, unless otherwise provided in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor, if area shown on Drawings is not acceptable.

8. ENVIRONMENTAL AND NATURAL RESOURCES LAWS AND REGULATIONS

8.1. Bidder's attention is directed to the Supplementary Conditions for ordinances and regulations dealing with the prevention of pollution and preservation of natural resources which may affect the performance of the Work. Bidder shall take such ordinances and regulations into consideration in preparation and submission of its Bid.

9. INTERPRETATIONS AND ADDENDA

9.1. All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by the office issuing documents as having received the Bidding Documents. Questions received less than 10 days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

9.2. Addenda may also be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer.

10. BID SECURITY

10.1. Bid shall be accompanied by Bid security made payable to Owner in an amount of 5 percent of Bidder's maximum Bid price and in the form of a penal Bid bond (on the attached form), issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions.

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- 10.2. The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within the time period specified in Article Signing of Agreement, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults. Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of the 7th day after the Effective Date of the Agreement or the number of days specified for all Bids to remain subject to acceptance in Article Bids to Remain Subject to Acceptance, whereupon Bid security furnished by such Bidders will be returned.
- 10.3. Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within 7 days after Bid opening.
11. CONTRACT TIMES
- 11.1. The number of days within which, or the dates by which, Milestones are to be achieved and the Work is to be substantially completed and ready for final payment are set forth in the Agreement.
12. LIQUIDATED DAMAGES
- 12.1. Provisions for liquidated damages, if any, are set forth in the Agreement.
13. SUBSTITUTE AND "OR-EQUAL" ITEMS
- 13.1. The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or-equal" items. Whenever it is specified or described in the Bidding Documents that a substitute or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement.
14. SUBCONTRACTORS, SUPPLIERS, AND OTHERS
- 14.1. Oregon Revised Statutes (ORS) 279C.370 requires Bidders for public improvement projects exceeding \$100,000 in Contract Price to submit First-Tier Subcontractor Disclosure Form with Bid, or within 2 working hours of Bid closing. Disclosure form identifies first-tier Subcontractors that will furnish labor or labor and materials equal to 5 percent of Contract Price or \$15,000 whichever is greater, or \$350,000, regardless of percentage of Contract Price. Disclosure form not submitted

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with Bid or within 2 working hours of Bid closing will cause Bid to be considered nonresponsive.

15. WAGE RATES

15.1. The Work under these Bidding Documents is to be paid for by public funds; therefore, minimum prevailing wage rates published by BOLI are applicable. Refer to Paragraph 7.10 of the Supplementary Conditions for more information.

15.2. Oregon Statutes require that Bids for public work, including those public work projects financed by federal funds and subject to the Davis Bacon Act, shall include a statement by Bidder that it will include in its Agreement the provisions of ORS 279C.840 or 40 USC 276a. When the Bid Form in the Bidding Documents contains a statement of Bidder's declaration of compliance with ORS 279C.840 or 40 USC 276a, the Bidder's signing of the Bid constitutes compliance with this Oregon Statute. If the Bid Form does not contain such statement, each Bidder shall submit with its Bid for the Work, a separately signed statement that it will include the provisions of ORS 279C.840 or 40 USC 276a in the Agreement.

15.3. Oregon Statute 279C.836 requires that, before starting work on a contract or subcontract for a public works project, Contractor or Subcontractor shall file with the Construction Contractors Board a public works bond with the corporate surety authorized to do business in the State of Oregon in the amount of \$30,000.

16. PREPARATION OF BID

16.1. Bidders shall submit a Bid Price for all Schedules and Bid Alternates or Bidder shall be considered nonresponsive.

16.2. With each copy of the Bidding Documents, Bidder will be furnished one separate unbound copy of the Bid Form, and, if applicable, the Bid Bond Form. No substitution of the Bid Form will be allowed.

16.3. All blanks on the Bid Form shall be completed by typing or printing with ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each unit price item listed therein.

16.4. A Bid by a corporation shall be executed in the corporate name by the president or a vice president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.

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- 16.5. A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.
- 16.6. A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 16.7. A Bid by an individual shall show the Bidder's name and official address.
- 16.8. A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 16.9. All names shall be typed or printed in ink below the signatures.
- 16.10. The Bid shall contain an acknowledgement of receipt of all Addenda; the numbers of which shall be filled in on the Bid Form.
- 16.11. Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 16.12. The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number and class, if applicable, shall also be shown on the Bid Form.
17. BASIS OF BID; COMPARISON OF BIDS
- 17.1. Unit Price:
- 17.1.1. Bidders shall submit a Bid on a unit price basis for each item of Work listed in each Bid schedule. The Owner intends to award at a minimum Schedule A at the time of Bid Evaluation. Deferred Award Schedule C may occur at any time between Bid Evaluation and the number of days defined in Deferred Award Schedule C.
- 17.1.2. The total of all estimated prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.
- 17.1.3. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the

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indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

17.1.4. Units of measure shown on Bid Form shall have the meanings as described in Section 01 29 00, Payment Procedures.

18. SUBMISSION OF BID

18.1. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the following data:

18.1.1. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids.

18.1.2. Contractor's License No.: _____.

18.1.3. First-Tier Subcontractor Disclosure Form.

18.1.4. Affidavit of Noncollusion.

18.1.5. City of Millersburg Form: BC-1 List of Contacted Disadvantaged Business Enterprises

18.2. A Bid shall be submitted no later than the date and time prescribed, and at the place indicated in the Advertisement for Bids. Enclose Bid in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), name and address of Bidder, and accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED."

19. MODIFICATION AND WITHDRAWAL OF BID

19.1. A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.

19.2. If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

20. OPENING OF BIDS

20.1. Bids will be opened at the time and place indicated in the Advertisement for Bids and unless obviously nonresponsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

21. BIDS TO REMAIN SUBJECT TO ACCEPTANCE

21.1. All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

22. EVALUATION OF BIDS AND AWARD OF CONTRACT

22.1. Nonresident Bidders: In determining the lowest responsible Bidder, Owner will for the purpose of awarding the Contract, add a percent increase on the Bid of a nonresident Bidder equal to the percent, if any, of the preference given to that Bidder in the state in which the Bidder resides.

22.2. Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

22.3. More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

22.4. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

22.5. In evaluating Bidders, Owner may consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted either with the Bid, or otherwise prior to issuance of the Notice of Award.

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22.6. Owner may conduct such investigations as Owner deems necessary to establish responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work in accordance with the Contract Documents.

22.7. If the Contract is to be awarded, Owner will award the Contract to Bidder whose Bid is in the best interests of the Project.

23. CONTRACT SECURITY AND INSURANCE

23.1. Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to bonds and insurance. When Successful Bidder delivers executed Agreement to Owner, it shall be accompanied by such bonds.

24. SIGNING OF AGREEMENT

24.1. When Owner issues a Notice of Award to Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement along with the other Contract Documents that are identified in the Agreement as attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within 10 days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder with a complete set of the Drawings with appropriate identification.

25. RETAINAGE

25.1. Provisions concerning retainage and Contractor's rights to deposit securities in lieu of retainage, if applicable, are set forth in the Agreement.

END OF SECTION

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NOTE TO BIDDER: Use typewriter or ink for completing this Bid Form.

**BID FORM
(STIPULATED PRICE BASIS)**

1. BID RECIPIENT

1.1. This Bid is submitted to:

Owner: City of Millersburg
Address: 4222 NE Old Salem Road, Millersburg Oregon 97321
Project Identification: Transition Parkway and Linear Park Project
Contract No.: 2022-006

1.2. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

2. BIDDER'S ACKNOWLEDGEMENTS

2.1. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid for Schedule A, Schedule B and all applicable Bid Alternates will remain subject to acceptance for 60 days after the Bid Opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner. This Bid for Schedule C and all applicable Bid Alternates will remain subject to acceptance for up to 245 days following the Bid Opening.

2.1.1. Owner may choose to exercise a Deferred Award – Schedule C during this same 245-day period. For the Deferred Award – Schedule C, Bid Price will be factored at the time of Award by the Engineering News Record, Construction Cost Index 20 City Average (ENR-CCI20) in accordance with the following formula.

Factored Deferred Award Schedule C Price = Schedule C Bid Price *
[ENR-CCI20 (month prior to Bid Alternate Award)]/[ENR-CCI20 (Month of Bid Opening)].

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If Owner declines to exercise Deferred Award – Schedule C, Owner will not pay for any expenses or materials for Schedule C.

3. BIDDER’S REPRESENTATIONS

3.1. In submitting this Bid, Bidder represents that:

3.1.1. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged.

<u>Addendum No.</u>	<u>Addendum Date</u>
_____	_____
_____	_____
_____	_____

(Bidder shall insert number of each Addendum received.)

3.1.2. Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

3.1.3. Bidder is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

3.1.4. Bidder has carefully studied: i) reports of explorations and tests of subsurface conditions at or contiguous to the Site and drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) which have been identified in Paragraph 5.03 of the Supplementary Conditions as containing reliable “technical data,”; and ii) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph 5.06 of the Supplementary Conditions as containing reliable “technical data.”

3.1.5. Bidder has considered the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly

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required by the Bidding Documents; and (3) Bidder's safety precautions and programs.

3.1.6. Based on information and observations referred to in paragraph above, Bidder does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) Bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

3.1.7. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

3.1.8. Bidder has given Engineer written notice of conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.

3.1.9. The Bidding Documents are generally sufficient to indicate and convey understanding of terms and conditions for the performance of the Work for which this Bid is submitted.

4. BIDDER'S CERTIFICATION

4.1. Bidder Certifies:

4.1.1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization or corporation;

4.1.2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

4.1.3. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

4.1.4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this paragraph:

4.1.4.1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;

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4.1.4.2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish Bid prices at artificial noncompetitive levels, or (c) to deprive Owner of the benefits of free and open competition;

4.1.4.3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, noncompetitive levels; and

4.1.4.4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

4.1.5. Required sales and use taxes are included in the stated Bid prices for the Work unless provision is made herein for the Bidder to separately itemize the estimated amount of sales tax or if Instructions to Bidders state Owner is tax exempt.

4.1.6. Bidder accepts the provisions required by ORS 279C.840 relating to prevailing wage rates and that Bidder shall make applicable restitution to the Oregon Bureau of Labor and Industries Commissioner in accordance with ORS 279C.825.

4.1.7. Neither Bidder nor their Subcontractors are on the Bureau of Labor and Industries list of persons having violated prevailing wage rate laws.

4.1.8. Bidder has not discriminated against minority, women, or emerging small business enterprises in obtaining required subcontracts.

4.1.9. Bidder is not in violation of any tax laws described in ORS 305.385.

4.1.10. Bidder has established a drug-testing program for employees per ORS 279C.505.

4.1.11. In accordance with OAR 137-049-0200, Subcontractors performing work will be registered with the Construction Contractors Board before Subcontractor commences work.

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5. BASIS OF BIDS

5.1. Bidder shall complete the Work in accordance with the Contract Documents for the following price(s):

5.2. Unit Price Bid Schedule:

5.2.1. Unit prices have been computed in accordance with Paragraph 13.03.C of the General Conditions.

5.2.2. Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

5.2.3. Schedule A:

Unit Price Bid Schedule A					
Item No.	Description	Estimated Quantity	Unit	Bid Unit Price	Extended Bid Unit Price
1.	All work required with the exception of HMAC and HMAC Binder (retaining wall Stone Terra Ridgestone)	1	Lump Sum	\$	\$
2.	PG 64-22 Asphalt Cement in HMAC Base Course	145	Tons	\$	\$
3.	HMAC Base Course	2738	Tons	\$	\$
4.	PG 70-22 Asphalt Cement in HMAC Wearing Course	50	Tons	\$	\$
5.	HMAC Wearing Course	962	Tons	\$	\$
Total of Schedule A Extended Bid Unit Prices					\$

5.2.3.1. Schedule A Bid Alternate No. 1 Retaining Wall (UltraBlock Cut Stone): (ADD / DEDUCT) \$ _____

5.2.3.2. Schedule A Bid Alternate No. 2 Retaining Wall (UltraBlock Quarry Stone): (ADD / DEDUCT) \$ _____

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5.2.3.3. Schedule A Bid Alternate No. 3 Retaining Wall (gabions):
 (ADD / DEDUCT) \$ _____

5.2.4. Schedule B:

Unit Price Bid Schedule B					
Item No.	Description	Estimated Quantity	Unit	Bid Unit Price	Extended Bid Unit Price
1.	Schedule B	1	Lump Sum	\$	\$
Total of Schedule B Extended Bid Unit Prices					\$

5.2.5. Schedule C

Unit Price Bid Schedule C					
Item No.	Description	Estimated Quantity	Unit	Bid Unit Price	Extended Bid Unit Price
1.	All work required with the exception of HMAC and HMAC Binder (retaining wall Stone Terra Ridgestone)	1	Lump Sum	\$	\$
2.	PG 64-22 Asphalt Cement in HMAC Base Course	247	Tons	\$	\$
3.	HMAC Base Course	4662	Tons	\$	\$
4.	PG 70-22 Asphalt Cement in HMAC Wearing Course	85	Tons	\$	\$
5.	HMAC Wearing Course	1638	Tons	\$	\$
Total of Schedule C Extended Bid Unit Prices					\$

5.2.5.1. Schedule C Bid Alternate No. 1 Retaining Wall (UltraBlock Cut Stone): (ADD / DEDUCT) \$ _____

5.2.5.2. Schedule C Bid Alternate No. 2 Retaining Wall (UltraBlock Quarry Stone): (ADD / DEDUCT) \$ _____

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5.2.5.3. Schedule C Bid Alternate No. 3 Retaining Wall (gabions):
(ADD / DEDUCT) \$ _____

5.2.5.4. Schedule C Bid Alternate No. 4 Bid Price modification for
Award concurrent with Schedule A and Schedule B: (ADD /
DEDUCT) \$ _____

5.3. Base Bid Summary:

Schedule A: _____

Schedule B: _____

Total: _____

Schedule A is the minimum that will be awarded. The Owner has the right to award any combination or all of the remaining scheduled Bid Items.

The basis of low Bid will be the lowest total sum of Schedule A and Schedule B. It is the intent of the City of Millersburg to award a single contractor for all work, regardless of which Schedules are awarded as part of the Contract. Multiple contractors will not be awarded Schedules set forth in these Documents.

Deferred Award Schedule C may be awarded at later date as defined.

6. TIME OF COMPLETION

6.1. Base Bid: Bidder agrees the Work will be substantially complete on or before September 12, 2025, and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before October 17, 2025.

6.2. Schedule C: Bidder agrees the Work will be substantially complete on or before April 24, 2026, and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before May 29, 2026.

6.3. Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work, and any specified Milestones, within the Contract Times.

7. ATTACHMENTS TO THIS BID

7.1. The following documents are submitted with and made a condition of this Bid:

7.1.1. Required Bid security in the form of Bid bond.

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7.1.2. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids.

7.1.3. Contractor's License No.: _____.

7.1.4. First-Tier Subcontractor Disclosure Form (required within two hours of Bid closing).

7.1.5. Affidavit of Noncollusion.

8. DEFINED TERMS

8.1. The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

9. BID SUBMITTAL

9.1. This Bid submitted by:

If Bidder is:

An Individual

Name (typed or printed): _____

By (signature): _____

Doing business as: _____

A Partnership

Partnership Name: _____ (SEAL)

By: _____
(Signature of general partner – attach evidence of authority to sign)

Name (typed or printed): _____

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A Corporation

Corporation Name: _____ (SEAL)

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability): ____

By: _____
(Signature – attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____ (CORPORATE SEAL)

Attest: _____
(Signature of Corporate Secretary)

Date of Qualification to do business in Oregon is:
_____.

A Joint Venture

Joint Venturer Name: _____ (SEAL)

By: _____
(Signature of joint venture partner – attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

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Bidder's Business Address: _____

Phone No.: _____ FAX No.: _____

E-mail: _____

SUBMITTED on _____, 20_____

Oregon Contractor's License No.: _____

Contractor's License Class (where applicable): _____

Bidder is an Oregon company as defined in ORS 279A.120.

_____ Yes _____ No

END OF SECTION

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BID BOND

Any singular reference to Bidder, Surety, Owner, or other party shall be considered plural where applicable.

BIDDER (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

City of Millersburg

4222 NE Old Salem Road

Millersburg, Oregon 97321

BID

Bid Due Date: 02/08/2024.

Project (Brief Description Including Location):

BOND

Bond Number:

Date (Not later than Bid due date):

Penal sum

(Words)

(Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

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BIDDER

SURETY

_____(Seal)
Bidder's Name and Corporate Seal

_____(Seal)
Surety's Name and Corporate Seal

By: _____
Signature and Title

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

Attest: _____
Signature and Title

Note: Above addresses are to be used for giving required notice.

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1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Surety's liability.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2. All Bids are rejected by Owner, or
 - 3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

END OF SECTION

FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM

PROJECT NAME: _____

BID #: _____ **BID CLOSING: Date:** _____ **Time**
: _____

This form shall be submitted at the location specified in the Advertisement/Invitation to Bid within 2 working hours after the advertised Bid closing time on advertised Bid closing date.

List below the name of each Subcontractor that will be furnishing labor or labor and materials and that is required to be disclosed, the category of work that Subcontractor will be performing, and dollar value of subcontract. Enter "NONE" if there are no Subcontractors that need to be disclosed. (Attach additional sheets if needed.)

	NAME	DOLLAR VALUE	CATEGORY OF WORK
1)	_____	\$ _____	_____
2)	_____	\$ _____	_____
3)	_____	\$ _____	_____
4)	_____	\$ _____	_____
5)	_____	\$ _____	_____
6)	_____	\$ _____	_____
7)	_____	\$ _____	_____
8)	_____	\$ _____	_____

Failure to submit this form by the disclosure deadline will result in a nonresponsive Bid. A nonresponsive Bid will not be considered for award.

FORM SUBMITTED BY (BIDDER NAME): _____

CONTACT NAME: _____ **PHONE NO.:** _____

END OF SECTION

PART 2

CONTRACTING REQUIREMENTS

AGREEMENT

THIS AGREEMENT is by and between _____

(Owner) and _____

(Contractor).

Owner and Contractor, in consideration of the mutual covenants set forth herein, agree as follows:

1. WORK

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

1.1.1. Schedule A: approximately 1,000 feet of arterial roadway, grading, potable water distribution main, stormwater piping, irrigation, landscaping approximately 4 acres of linear park, landscaping, irrigation, and sediment and erosion control.

1.1.1.1. Bid Alternates as described in Section 00 41 13, Bid Form, (if adopted).

1.1.2. Schedule B: approximately 1,200 feet of potable water distribution main and sediment and erosion control.

1.1.3. Schedule C (if awarded): approximately 2,700 feet of arterial roadway, grading, potable water distribution main, stormwater piping, irrigation, landscaping approximately 6 acres of linear park, landscaping, irrigation, and sediment and erosion control.

1.1.3.1. Bid Alternates as described in Section 00 41 13, Bid Form, (if adopted).

2. ENGINEER

2.1. The Project has been designed by CH2M HILL ENGINEERS, INC., a wholly owned subsidiary of Jacobs Engineering Group Inc (Engineer), who is to act as Owner's representative, assume duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

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3. CONTRACT TIMES

3.1. Time of the Essence: Time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

3.2. Dates for Substantial Completion and Final Payment:

3.2.1. Schedule A and Schedule B: The Work shall be substantially completed on or before _____, 20__, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before _____, 20__.

3.2.2. Schedule C, if awarded: The Work shall be substantially completed on or before _____, 20__, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before _____, 20__.

3.3. Liquidated Damages:

3.3.1. Contractor and Owner recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph Contract Times above, plus any extensions thereof allowed in accordance with Article 11 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay Owner the amount specified in the City of Albany, Oregon: Albany Standard Construction Specifications Section 108.06.00 LIQUIDATED DAMAGES for each day that expires after the time specified herein for Substantial Completion until the Work is substantially complete.

3.3.2. After Substantial Completion, if Contractor neglects, refuses, or fails to complete remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner 50 percent of the amount specified in the City of Albany, Oregon: Albany Standard Construction Specifications Section 108.06.00 LIQUIDATED DAMAGES for each day that expires after the time specified herein for completion and readiness for final payment until the Work is completed and ready for final payment.

4. PREVAILING WAGE

4.1. Contractor will comply with the requirements in ORS 279C.840.

5. CONTRACT PROVISIONS

5.1. Contractor shall pay promptly, as due, all persons supplying labor or materials for the prosecution of the Work provided for in the Contract and shall be responsible for such payment of all persons supplying such labor or material to any subcontractor.

5.1.1. ORS 279C.580(3)(a) requires the prime Contractor to include a clause in each subcontract requiring Contractor to pay the first-tier subcontractor for satisfactory performance under its subcontract within 10 days out of such amounts as are paid to the prime Contractor by the public contracting agency; and

5.1.2. ORS 279C.580(3)(b) requires the prime Contractor to include a clause in each subcontract requiring Contractor to pay an interest penalty to the first-tier subcontractor if payment is not made within 30 days after receipt of payment from the public contracting agency.

5.1.3. ORS 279C.580(4) requires the prime Contractor to include in every subcontract a requirement that the payment and interest penalty clauses required by ORS 279C.580(3)(a) and (b) be included in every Contract between a subcontractor and a lower-tier subcontractor or supplier.

5.2. Contractor shall promptly pay all contributions or amounts due the Industrial Accident Fund from such Contractor or subcontractor incurred in the performance of the Contract and shall be responsible that all sums due the State Unemployment Compensation Fund from Contractor or any subcontractor in connection with the performance of the Contract shall promptly be paid.

5.3. Contractor shall not permit any lien or claim to be filed or prosecuted against the public contracting agency on account of any labor or material furnished and agrees to assume responsibility for satisfaction of any such lien so filed or prosecuted.

5.4. A notice of claim on Contractor's payment bond shall be submitted only in accordance with ORS 279C.600 and ORS 279C.605.

5.5. Contractor and any subcontractor shall pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

5.6. Contractor shall demonstrate to the Public Contracting Agency that an employee drug-testing program is in place within 10 days of receiving a Notice of Award.

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5.7. If Contractor fails, neglects, or refuses to make prompt payment of any claim for labor or materials furnished to the Contractor or a subcontractor by any person in connection with the Contract as such claim becomes due, the public contracting agency may pay such claim to the persons furnishing the labor or material and charge the amount of payment against funds due or to become due Contractor by reason of the Contract. The payment of a claim in the manner authorized hereby shall not relieve the Contractor or his or her surety from his or her or its obligation with respect to any unpaid claim. If the public contracting agency is unable to determine the validity of any claim for labor or material furnished, the public contracting agency may withhold from any current payment due Contractor an amount equal to said claim until its validity is determined and the claim, if valid, is paid.

5.8. If the Contractor or a first-tier subcontractor fails, neglects, or refuses to make payment to a person furnishing labor or materials in connection with the public contract for a public improvement within 30 days after receipt of payment from the public contracting agency or Contractor, the Contractor or first-tier subcontractor shall owe the person the amount due plus interest charges commencing at the end of the 10-day period that payment is due under ORS 279C.580(4) and ending upon final payment, unless payment is subject to a good faith dispute as defined in ORS 279C.580. The rate of interest charged to Contractor or first-tier subcontractor on the amount due shall equal three times the discount rate on 90-day commercial paper in effect at the Federal Reserve Bank in the Federal Reserve District that includes Oregon on the date that is 30 days after the date when payment was received from the public contracting agency or from the Contractor, but the rate of interest shall not exceed 30 percent. The amount of interest may not be waived.

5.9. If the Contractor or a subcontractor fails, neglects, or refuses to make payment to a person furnishing labor or materials in connection with the public contract, the person may file a complaint with the Construction Contractor's Board, unless payment is subject to a good faith dispute as defined in ORS 279C.580.

5.10. Contractor shall promptly, as due, make payment to any person, co-partnership, association, or corporation, furnishing medical, surgical and hospital care or other needed care and attention, incident to sickness or injury, to employees of such Contractor, of all sums which the Contractor agrees to pay for such services and all monies and sums which the Contractor collected or deducted from the wages of employees pursuant to any law, contract or agreement for the purpose of providing or paying for such service.

5.11. Contractor shall employ no person for more than 10 hours in any one day, or 40 hours in any one week, except in cases of necessity, emergency, or where public policy absolutely requires it, and in such cases, except in cases of contracts for personal services designated under ORS 279A.055, Contractor shall pay the employee at least time and one-half pay for all overtime in excess of 8 hours a day or

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40 hours in any 1 week when the Work is 5 consecutive days, Monday through Friday; or for all overtime in excess of 10 hours a day or 40 hours in any 1 week when the Work week is 4 consecutive days, Monday through Friday; and for all Work performed on Saturday and on any legal holidays as specified in ORS 279C.540.

5.12. The Contractor must give notice to employees who work on this Contract in writing, either at the time of hire or before commencement of work on the Contract, or by posting a notice in a location frequented by employees, of the number of hours per day and the days per week that the employees may be required to work.

5.13. The provisions of ORS 279C.800 to ORS 279C.870 relating to Oregon's prevailing wage rates and 40 U.S.C. 276a will be complied with.

5.14. Unless exempt under ORS 279C.836(4), (7), (8) or (9), before starting work on this Contract, or any subcontract hereunder, Contractor and all subcontractors must have on file with the Construction Contractors Board a public works bond with a corporate surety authorized to do business in the state of Oregon in the amount of \$30,000. The bond must provide that the Contractor or subcontractor will pay claims ordered by the Bureau of Labor and Industries to workers performing labor upon public works projects. The bond must be a continuing obligation, and the surety's liability for the aggregate of claims that may be payable from the bond may not exceed the penal sum of the bond. The bond must remain in effect continuously until depleted by claims paid under ORS 279C.836(2), unless the surety sooner cancels the bond. Contractor further certifies that Contractor will include in every subcontract or provision requiring a subcontractor to have a public works bond filed with the Construction Contractors Board before starting Work on the Project, unless exempt under ORS 279C.836(4), (7), (8), or (9).

5.14.1. Unless exempt under ORS 279C.836(4), (7), (8), or (9), before permitting a subcontractor to start Work on this public works project, the Contractor shall verify that the subcontractor has filed a public works bond as required under this Section or has elected not to file a public works bond under ORS 279C.836(7).

5.14.2. Unless public contracting agency has been notified of any applicable exemptions under ORS 279C.836(4), (7), (8), or (9), the public works bond requirement above is in addition to any other bond contractors or subcontractors may be required to obtain under this Contract.

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5.15. Contractor or Contractor's surety and every subcontractor or subcontractor's surety shall file certified payroll statements with the public contracting agency in writing, pursuant to ORS 279C.845.

5.15.1. If a Contractor is required to file certified statements under ORS 279C.845, the public contracting agency shall retain 25 percent of any amount earned by the Contractor on the public works project until the Contractor has filed with the public agency certified statement as required by ORS 279C.845. The public contracting agency shall pay the Contractor the amount retained within 14 days after the Contractor files the required certified statements, regardless of whether a subcontractor has failed to file certified statements required by statute. The public contracting agency is not required to verify the truth of the contents of certified statements filed by the Contractor under this Section and ORS 279C.845.

5.15.2. The Contractor shall retain 25 percent of any amount earned by a first-tier subcontractor on this public works contract until the subcontractor has filed with the public agency certified statements as required by ORS 279C.845. The Contractor shall verify that the first-tier subcontractor has filed the certified statements before the Contractor may pay the subcontractor any amount retained. The Contractor shall pay the first-tier subcontractor the amount retained within 14 days after the subcontractor files the certified statements as required by ORS 279C.845. Neither the public agency nor the Contractor is required to verify the truth of the contents of certified statements filed by a first-tier subcontractor.

5.16. All employers, including Contractor, that employ subject workers who work under this Contract shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. Contractor shall ensure that each of its subcontractors complies with these requirements.

5.17. All sums due the State Unemployment Compensation Fund from the Contractor or any subcontractor in connection with the performance of the Contract shall be promptly so paid.

5.18. The Contract may be canceled at the election of public contracting agency for any willful failure on the part of Contractor to faithfully perform the Contract according to its terms.

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5.19. Contract Fee: The Owner is required to pay a fee to the Bureau of Labor and Industries pursuant to the provisions of ORS 279C.825(1). The fee is one-tenth of 1 percent of the price of this Contract, but not less than \$250 nor more than \$7,500, regardless of the Contract price. The fee shall be paid at the time Owner enters into this Contract. The fee is payable to the Commissioner of the Bureau of Labor and Industries and shall be mailed or otherwise delivered to the Bureau at the following address:

5.19.1. Bureau of Labor and Industries
Wage and Hour Division
Prevailing Wage Unit
800 NE Oregon Street, #32
Portland, OR 97232

5.20. Contractor certifies that it has not discriminated against minorities, women or emerging small business enterprises in obtaining any required subcontractors.

5.21. Contractor certifies its compliance with the Oregon tax laws, in accordance with ORS 305.385.

5.22. In the performance of this Contract, the Contractor shall use, to the maximum extent economically feasible, recycled paper, materials, and supplies.

5.23. Contractor certifies that all subcontractors performing construction work under this Contract will be registered with the Construction Contractors Board or licensed by the state Landscaper Contractors Board in accordance with ORS 701.035 to 701.056 before the subcontractors commence work under this Contract.

5.24. In compliance with the provisions of ORS 279C.525, the following is a list of federal, state and local agencies, of which the Owner has knowledge, that have enacted ordinances or regulations dealing with the prevention of environmental pollution and the preservation of natural resources that may affect the performance of the Contract:

5.24.1. FEDERAL AGENCIES

5.24.1.1. Agriculture, Department of.

5.24.1.2. Forest Service.

5.24.1.3. Soil Conservation Service.

5.24.1.4. Defense, Department of.

5.24.1.5. Army Corps of Engineers.

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- 5.24.1.6. Environmental Protection Agency.
- 5.24.1.7. Interior, Department of.
- 5.24.1.8. Bureau of Sport Fisheries and Wildlife.
- 5.24.1.9. Bureau of Outdoor Recreation.
- 5.24.1.10. Bureau of Land Management.
- 5.24.1.11. Bureau of Indian Affairs.
- 5.24.1.12. Bureau of Reclamation.
- 5.24.1.13. Labor, Department of.
- 5.24.1.14. Occupational Safety and Health Administration.
- 5.24.1.15. Transportation, Department of.
- 5.24.1.16. Coast Guard.
- 5.24.1.17. Federal Highway Administration.

5.24.2. STATE AGENCIES

- 5.24.2.1. Agriculture, Department of.
- 5.24.2.2. Environmental Quality, Department of.
- 5.24.2.3. Fish and Wildlife, Department of.
- 5.24.2.4. Forestry, Department of.
- 5.24.2.5. Geology and Mineral Industries, Department of.
- 5.24.2.6. Human Resources, Department of.
- 5.24.2.7. Land Conservation and Development Commission.
- 5.24.2.8. Soil and Water Conservation Commission.
- 5.24.2.9. State Engineer.
- 5.24.2.10. State Land Board.
- 5.24.2.11. Water Resources Board.

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5.24.3. LOCAL AGENCIES

- 5.24.3.1. City Council.
- 5.24.3.2. County Court.
- 5.24.3.3. County Commissioners, Board of.
- 5.24.3.4. Port Districts.
- 5.24.3.5. Metropolitan Service Districts.
- 5.24.3.6. County Service Districts.
- 5.24.3.7. Sanitary Districts.
- 5.24.3.8. Water Districts.
- 5.24.3.9. Fire Protection Districts.

6. CONTRACT PRICE

6.1. For all Work, at the unit prices stated in Contractor’s Bid, attached hereto as an exhibit with Schedules and Bid Alternates summary shown in the Schedule and Bid Alternate Contract Summary table:

Schedule and Bid Alternate Contract Summary			
Description	Additive / Deductive	Price	Awarded / Adopted (YES / NO)
Schedule A	Additive	\$	YES
Schedule A Bid Alternate 1		\$	
Schedule A Bid Alternate 2		\$	
Schedule A Bid Alternate 3		\$	
Schedule B	Additive	\$	YES
Schedule C	Additive	\$	
Schedule C Bid Alternate 1		\$	
Schedule C Bid Alternate 2		\$	
Schedule C Bid Alternate 3		\$	

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Schedule and Bid Alternate Contract Summary			
Schedule C Bid Alternate 4	Deductive	\$	
Total of Adopted Estimated Contract Prices			

Notes:

- 1.) Schedule A and Schedule C include Asphalt Binder for which the price is subject to the Asphalt Cement Material Price Escalation/De-escalation clause as defined in Section 01 29 00, Payment Procedures.
- 2.) Schedule C, if the award is deferred, is subject to the Deferred Award Schedule C price modification clause as defined in Section 01 26 00, Contract Modification Procedures.

7. PAYMENT PROCEDURES

7.1. Submittal and Processing of Payments: Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

7.2. Progress Payments and Retainage: Owner will make progress payments on account of the Contract Price on the basis of Contractor's Application for Payment on the date of each month as established in the preconstruction conference during performance of the Work as provided herein. All such payments will be measured by the Schedule of Values established as provided in Paragraph 2.05 of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided in the General Requirements.

7.2.1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 15.01 of the General Conditions:

7.2.1.1. Ninety-five percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, Owner, on recommendation of Engineer, may determine that as long as the character and progress of the Work remain satisfactory to them, there will be no additional retainage; and

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7.2.1.2. Ninety-five percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

7.2.2. In lieu of retainage, and at the Contractor's option, provisions may be made as provided in ORS 279C.560 for either depositing with Owner or in a bank or trust company, bonds or securities for all or any portion of the retainage in a form acceptable to Owner. Interest on such bonds or securities shall accrue to Contractor. Costs incurred by Owner as a result of this option will be deducted from Contractor's final payment.

7.2.3. Upon Substantial Completion, Owner will pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less such amounts as Engineer will determine in accordance with Paragraph 15.01.C.6 of the General Conditions and less 100 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

7.3. Final Payment:

7.3.1. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner will pay the remainder of the Contract Price as recommended by Engineer as provided in Paragraph 15.06.

8. INTEREST

8.1. Monies not paid when due as provided in Article 15 of the General Conditions shall bear interest at the rate of one percent per annum or the rate provided in ORS 279C.570, whichever is greater.

9. CONTRACTOR'S REPRESENTATIONS

9.1. In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

9.1.1. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

9.1.2. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

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9.1.3. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

9.1.4. Contractor has carefully studied: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) if any, which have been identified in Paragraph 5.03 of the Supplementary Conditions as containing reliable “technical data”, and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site which have been identified in Paragraph 5.06 of the Supplementary Conditions as containing reliable “technical data.”

9.1.5. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on 1) the cost, progress, and performance of the Work; 2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and 3) Contractor’s safety precautions and programs.

9.1.6. Based on the information and observations referred to above, Contractor does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

9.1.7. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

9.1.8. Contractor has given Engineer written notice of conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

9.1.9. The Contract Documents are generally sufficient to indicate and convey understanding of terms and conditions for performance and furnishing of the Work.

10. CONTRACT DOCUMENTS

10.1. Contents:

10.1.1. The Contract Documents that are attached to this Agreement (except as expressly noted otherwise) consist of the following:

10.1.1.1. This Agreement (pages 1 to ____, inclusive).

10.1.1.2. Performance bond (pages ____ to ____, inclusive).

10.1.1.3. Payment bond (pages ____ to ____, inclusive).

10.1.1.4. General Conditions (pages ____ to ____, inclusive).

10.1.1.5. Supplementary Conditions (pages ____ to ____, inclusive).

10.1.1.6. Specifications as listed in the table of contents of the Project Manual.

10.1.1.7. Drawings consisting of 160 sheets with each sheet bearing the following general title: Transition Parkway and Linear Park.

10.1.1.8. Addenda (numbers ____ to ____, inclusive).

10.1.1.9. City of Millersburg Form: BC-1 List of Contacted Disadvantaged Business Enterprises

10.1.2. Exhibits to this Agreement (enumerated as follows):

10.1.2.1. Contractor's Bid (pages ____ to ____, inclusive).

10.1.3. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:

10.1.3.1. Notice to Proceed (pages ____ to ____, inclusive).

10.1.3.2. Work Change Directives.

10.1.3.3. Change Order(s).

10.2. There are no Contract Documents other than those listed above in this Article.

10.3. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 11.01 of the General Conditions.

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11. MISCELLANEOUS

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

11.2. Successors and Assigns: Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

11.3. Severability: Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

11.4. Assignment of Contract:

11.4.1. No assignment by a party hereto of any rights under or interests in the Contract shall be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment shall release or discharge the assignor from any duty or responsibility under the Contract Documents.

11.5. Subagreements. All of Contractor's subagreement must be in writing, executed by Contractor, and must incorporate and pass through all of the applicable requirements of the Contract Documents to the other party or parties to the subagreement. Use of a subagreement does not relieve Contractor of its responsibilities under the Contract Documents.

11.6. Third Party Beneficiary. The parties agree that the Oregon Department of Transportation (ODOT) is an intended third party beneficiary of this Agreement and all subagreements. Contractor shall name ODOT as an additional or dual obligee on Contractor's payment and performance bonds.

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11.7. Contractor's Certifications:

11.7.1. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this paragraph:

11.7.1.1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in Contract execution;

11.7.1.2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract Price at artificial noncompetitive levels, or (c) to deprive Owner of the benefits of free and open competition;

11.7.1.3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, noncompetitive levels; and

11.7.1.4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

11.7.2. Contractor certifies that it has made a good faith effort to subcontract with minority-owned, women-owned, disabled service veteran-owned and emerging small business enterprises (MWSDV-E), as described in ORS 200.045 and ORS 200.090.

CITY OF MILLERSBURG
TRANSITION PARKWAY AND LINEAR PARK

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement in triplicate. One counterpart each has been delivered to Owner, Contractor, and Engineer. All portions of the Contract Documents have been signed or identified by Owner and Contractor or on their behalf.

This Agreement will be effective on _____, 20__ (which is the Effective Date of the Agreement).

OWNER: _____

CONTRACTOR: _____

By: _____

By: _____

Title: _____

Title: _____

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest: _____

Attest: _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

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

License No. _____
(Where applicable)

Agent for service or process: _____

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

END OF SECTION

CITY OF MILLERSBURG
TRANSITION PARKWAY AND LINEAR PARK

PERFORMANCE BOND FORM

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR
(Name and Address):

SURETY
(Name and Address of Principal Place of Business):

OWNER (Name and Address):

CONTRACT

Date:
Amount:
Description (Name and Location):

BOND

Bond Number:
Date (Not earlier than Contract Date):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Company:

Signature: _____ (Seal)
Name and Title

Surety's Name and Corporate Seal

By: _____
Signature and Title
(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

Attest: _____
Signature and Title

CITY OF MILLERSBURG
TRANSITION PARKWAY AND LINEAR PARK

CONTRACTOR AS PRINCIPAL

SURETY

Company:

Signature: _____(Seal)
Name and Title

_____(Seal)
Surety's Name and Corporate Seal

By: _____
Signature and Title

(Attach Power of Attorney)

Attest: _____
Signature and Title

CITY OF MILLERSBURG
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1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.
2. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 3.1.
3. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
 - 3.1. Owner has notified Contractor and Surety, at the addresses described in Paragraph 10 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
 - 3.2. Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 3.1; and
 - 3.3. Owner has agreed to pay the Balance of the Contract Price to:
 1. Surety in accordance with the terms of the Contract;
 2. Another contractor selected pursuant to Paragraph 4.3 to perform the Contract.
4. When Owner has satisfied the conditions of Paragraph 3, Surety shall promptly and at Surety's expense take one of the following actions:
 - 4.1. Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
 - 4.2. Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 4.3. Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and Contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
 - 4.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:
 1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
 2. Deny liability in whole or in part and notify Owner citing reasons therefor.
5. If Surety does not proceed as provided in Paragraph 4 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 4.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.
6. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To a limit of the amount of this Bond, but subject to

CITY OF MILLERSBURG
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commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

6.1. The responsibilities of Contractor for correction of defective Work and completion of the Contract;

6.2. Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions or failure to act of Surety under Paragraph 4; and

6.3. Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

7. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

8. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions.

12.1. Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.

12.2. Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

12.3. Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

12.4. Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

FOR INFORMATION ONLY – Name, Address and Telephone
Surety Agency or Broker
Owner's Representative (engineer or other party)

END OF SECTION

CITY OF MILLERSBURG
TRANSITION PARKWAY AND LINEAR PARK

PAYMENT BOND FORM

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR
(Name and Address):

SURETY
(Name and Address of Principal Place of Business):

OWNER (Name and Address):

CONTRACT

Date:
Amount:
Description (Name and Location):

BOND

Bond Number:
Date (Not earlier than Contract Date):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Company:

Signature: _____(Seal)
Name and Title

_____(Seal)
Surety's Name and Corporate Seal

By: _____
Signature and Title
(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

Attest: _____
Signature and Title

CITY OF MILLERSBURG
TRANSITION PARKWAY AND LINEAR PARK

CONTRACTOR AS PRINCIPAL

SURETY

Company:

Signature: _____(Seal)
Name and Title

_____(Seal)
Surety's Name and Corporate Seal

By: _____
Signature and Title

(Attach Power of Attorney)

Attest: _____
Signature and Title

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1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to Owner, this obligation shall be null and void if Contractor:
 - 2.1. Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 2.2. Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
4. Surety shall have no obligation to Claimants under this Bond until:
 - 4.1. Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the addresses described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
 - 4.2. Claimants who do not have a direct contract with Contractor:
 1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
3. Not having been paid within the above 30 days, have sent a written notice to Surety and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.
6. Reserved.
7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.
8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.
9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.
10. Surety hereby waives notice of any change, including changes of time, to the Contract or to

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TRANSITION PARKWAY AND LINEAR PARK

related Subcontracts, purchase orders and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. Definitions:

15.1. Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's Subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2. Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3. Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

FOR INFORMATION ONLY – Name, Address and Telephone Surety Agency or Broker: Owner's Representative (engineer or other party):

END OF SECTION

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by



Issued and Published Jointly by



These General Conditions have been prepared for use with the Agreement Between Owner and Contractor for Construction Contract (EJCDC® C-520, Stipulated Sum, or C-525, Cost-Plus, 2013 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other.

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
5. *Bidder*—An individual or entity that submits a Bid to Owner.
6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued

on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.
11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C.

- §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
 13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
 14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
 15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
 16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
 17. *Cost of the Work*—See Paragraph 13.01 for definition.
 18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
 19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
 20. *Engineer*—The individual or entity named as such in the Agreement.
 21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
 22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
 23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
 24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
 25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
 26. *Notice of Award*—The written notice by Owner to a Bidder of Owner’s acceptance of the Bid.
 27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
 28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
 29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor’s plan to accomplish the Work within the Contract Times.
 30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
 31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing

- the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or “RPR” includes any assistants or field staff of Resident Project Representative.
 33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
 34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals and the performance of related construction activities.
 35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
 36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
 37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
 38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
 39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
 40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
 41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
 42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
 43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
 44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made

available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.

45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. Intent of Certain Terms or Adjectives:
 1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect

or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. Day:

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

D. Defective:

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).

E. Furnish, Install, Perform, Provide:

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of

insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 2. a preliminary Schedule of Submittals; and
 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph

2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic

media or digital format, either directly, or through access to a secure Project website.

- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

- A. Standards Specifications, Codes, Laws and Regulations
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference

standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

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

3.03 *Reporting and Resolving Discrepancies*

A. Reporting Discrepancies:

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract

Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. Resolving Discrepancies:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under

the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude

Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

4.03 *Reference Points*

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

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 2. abnormal weather conditions;
 3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
 4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.
- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

**ARTICLE 5 – AVAILABILITY OF LANDS;
SUBSURFACE AND PHYSICAL CONDITIONS;
HAZARDOUS ENVIRONMENTAL CONDITIONS**

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. Limitation on Use of Site and Other Areas:

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all

court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions

with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

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

5.04 Differing Subsurface or Physical Conditions

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

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
2. is of such a nature as to require a change in the Drawings or Specifications; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner

and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. Possible Price and Times Adjustments:

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
- b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will

be subject to the provisions of Paragraph 13.03; and,

- c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
 - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing

Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
 - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.
 - C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to

which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. Possible Price and Times Adjustments:

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
 - d. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
2. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

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

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and

hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by

an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is maintaining the policies, coverages, and

endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other

party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.

- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
 - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
 - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).
 - 4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
 - 1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
 - 2. claims for damages insured by reasonably available personal injury liability coverage.
 - 3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO

commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage:
 - a. Such insurance shall be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Broad form property damage coverage.
 4. Severability of interest.
 5. Underground, explosion, and collapse coverage.
 6. Personal injury coverage.
 7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
 8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage
- afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.
- G. *Additional insureds:* The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance:* If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions:* The policies of insurance required by this Paragraph 6.03 shall:
1. include at least the specific coverages provided in this Article.

2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.

J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability

policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

A. *Builder's Risk:* Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.

3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).
 5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
 6. extend to cover damage or loss to insured property while in transit.
 7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
 8. allow for the waiver of the insurer's subrogation rights, as set forth below.
 9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
 10. not include a co-insurance clause.
 11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
 12. include performance/hot testing and start-up.
 13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
 - C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
 - D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
 - E. *Additional Insurance:* If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
 - F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.

- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR’S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner’s written consent, which will not be unreasonably withheld.

7.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or

not such items are specifically called for in the Contract Documents.

- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 *“Or Equals”*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or “or equal” item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.

- 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an “or equal” item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

- a. in the exercise of reasonable judgment Engineer determines that:

- 1) it is at least equal in materials of construction, quality, durability, appearance,

- strength, and design characteristics;
- 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) it has a proven record of performance and availability of responsive service; and
 - 4) it is not objectionable to Owner.
- b. Contractor certifies that, if approved and incorporated into the Work:
- 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may

request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
 3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - a. shall certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design,
 - 2) be similar in substance to that specified, and
 - 3) be suited to the same use as that specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,

- 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
- c. will identify:
 - 1) all variations of the proposed substitute item from that specified, and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.
- 7.06 *Concerning Subcontractors, Suppliers, and Others*
- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
 - B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
 - C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
 - D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed

acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of

Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.
- O. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
 - 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual

knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of

utility owners for connections for providing permanent service to the Work.

7.09 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of

such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

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

7.12 *Safety and Protection*

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

replacement of their property or work in progress.

- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
- G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *Safety Representative*

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

7.14 *Hazard Communication Programs*

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

7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

- A. Shop Drawing and Sample Submittal Requirements:

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

sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. Shop Drawings:
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.
2. Samples:
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which

intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- D. *Engineer's Review:*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
 6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
 7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.
 8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.
- E. *Resubmittal Procedures:*
1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
 2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
 3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to

Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 - 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 - 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 - 1. observations by Engineer;
 - 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 - 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 - 4. use or occupancy of the Work or any part thereof by Owner;
 - 5. any review and approval of a Shop Drawing or Sample submittal;
 - 6. the issuance of a notice of acceptability by Engineer;
 - 7. any inspection, test, or approval by others; or
 - 8. any correction of defective Work by Owner.
- D. If the Contract requires the Contractor to accept the assignment of a contract entered

into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees,

agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract

Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.

- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other

work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such

equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.
- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors,

members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER’S RESPONSIBILITIES

9.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer’s status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

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

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner’s duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner’s duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner’s identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner’s responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner’s responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner’s responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner’s Responsibilities*

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

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner’s responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner’s obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner’s employees and representatives shall comply with the specific applicable requirements of Contractor’s safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

10.01 *Owner’s Representative*

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

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

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

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
 - 1. Change Orders:
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order

also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.

- b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.
3. *Field Orders:* Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor

believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
 2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
 3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).
- C. *Contractor's Fee:* When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee

plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;

- d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
- e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
- f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.

2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
 4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

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

ARTICLE 12 – CLAIMS

12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be

submitted to the Claims process set forth in this Article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
 2. If Owner and Contractor agree to mediation, then after 60 days from such

agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval:* If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim:* If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results:* If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work:* The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case

the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
 - g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance that

Contractor is required by the Contract Documents to purchase and maintain.

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

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of

Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 Allowances

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances:* Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance:* Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 Unit Price Work

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
 2. there is no corresponding adjustment with respect to any other item of Work; and
 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 3. by manufacturers of equipment furnished under the Contract Documents;
 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 5. for acceptance of materials, mix designs, or equipment submitted for approval

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable

prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to

defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose,

or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

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

14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other

provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. Applications for Payments:

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. Review of Applications:

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation

by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
 4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or

- b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.
- D. Payment Becomes Due:
- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.
- E. Reductions in Payment by Owner:
- 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. the Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. the Contract Price has been reduced by Change Orders;

- i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
 - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - l. there are other items entitling Owner to a set off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a

permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
 - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that

part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

- 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

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

15.06 *Final Payment*

- A. Application for Payment:
 - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.
 - 2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;

- c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all disputes that Contractor believes are unsettled; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. Engineer's Review of Application and Acceptance:
- 1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are

necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

- C. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.
- D. *Payment Becomes Due*: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the

Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

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

warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 Owner May Suspend Work

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 Owner May Terminate for Cause

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and

- 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such

amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
 2. agree with the other party to submit the dispute to another dispute resolution process; or
 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

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

18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

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

termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

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

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof. The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix “SC” added thereto.

SC-1.01. Renumber Paragraph 1.01.A.21 to 1.01.A.21.a. and add the following new paragraphs:

1.01.A.21.b. *Geotechnical Data Report (GDR)*—The factual report that collects and presents data regarding actual subsurface conditions at or adjacent to the Site, including Technical Data and other geotechnical data, prepared by or for Owner in support of the Geotechnical Baseline Report. The GDR’s content may include logs of borings, trenches, and other site investigations, recorded measurements of subsurface water levels, the results of field and laboratory testing, and descriptions of the investigative and testing programs. The GDR does not include an interpretation of the data. If opinions, or interpretive or speculative non-factual comments or statements appear in a document that is labeled a GDR, such opinions, comments, or statements are not operative parts of the GDR and do not have contractual standing. Subject to that exception, the GDR is a Contract Document and included in Volume 5.

SC-1.01. Renumber Paragraph 1.01.A.38 to 1.01.A.38.a, and add the following new paragraphs:

1.01.A.38.b. *Specialist*—The term Specialist refers to a person, partnership, firm, or corporation of established reputation (or if newly organized, whose personnel have previously established a reputation in the same field), which is regularly engaged in, and which maintains a regular force of workers skilled in either (as applicable) manufacturing or fabricating items required by the Contract Documents, or otherwise performing Work required by the Contract Documents. Where the Specifications require the installation by a Specialist, that term shall also be deemed to mean either the manufacturer of the item, a person, partnership, firm, or corporation licensed by the manufacturer, or a person, partnership, firm, or corporation who will perform the Work under the manufacturer’s direct supervision.

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1.01.A.38.c. *Standard Specifications*—Wherever in these Contract Documents reference is made to the Standard Specifications, said reference shall be understood as referring to the City of Albany Oregon Construction Specifications which applicable parts are incorporated herein and made a part of these Documents by specific reference thereto. If requirements contained in the Standard Specifications are modified by or are in conflict with supplemental information in these Contract Documents, the requirements of these Contract Documents shall prevail.

SC-2.02. Delete Paragraph 2.02.A. in its entirety and insert the following new paragraph in its place:

2.02.A. Owner shall furnish to Contractor four copies of conformed Contract Documents incorporating and integrating all Addenda and any amendments negotiated prior to the Effective Date of the Contract (including one fully executed counterpart of the Agreement) and one copy in electronic portable document format (PDF). Additional printed copies of the conformed Contract Documents will be furnished upon request at the cost of reproduction.

SC-3.01. Add the following new paragraph immediately after Paragraph 3.01.E:

3.01.F. Sections of Division 01, General Requirements, govern the execution of the Work of all sections of the Specifications.

SC-5.02. Add the following language to the end of Paragraph 5.02.A.1:

Contractor shall not enter upon nor use property not under Owner control until appropriate easements have been executed and a copy is on file at the Site.

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.B:

5.03.C. The following reports of explorations and tests of subsurface conditions at or adjacent to the Site are known to Owner:

5.03.C.1. Report dated September 29, 2023, prepared by Jacobs Engineering Group Inc., 1100 NE Circle Blvd, Suite 300, Corvallis, Oregon, 97321, entitled “Geotechnical Data Report Millersburg Transition Parkway Project” consisting of 43 pages. The Technical Data contained in such report upon whose accuracy Contractor may rely are those indicated in the definition of Technical Data in the General Conditions.

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5.03.D. The following drawings of physical conditions relating to existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities) are known to Owner:

5.03.D.1. Drawings prepared by various entities, are included in Volume 3 – Reference Information.

5.03.D.1.a. None of the contents of such drawings is Technical Data on whose accuracy Contractor may rely.

5.03.E. Contractor may examine copies of reports and drawings identified in SC-5.03.C and SC-5.03.D that were not included with the Bidding Documents at Millersburg City Hall, 4222 NE Old Salem Road, Millersburg, Oregon 97321 during regular business hours, or may request copies from Engineer.

SC-5.06. Delete Paragraph 5.06.A and Paragraph 5.06.B in their entirety and insert the following in their place:

5.06.A. No reports or drawings related to Hazardous Environmental Conditions are known to Owner.

SC-5.06. Add the following language at the end of Paragraph 5.06.A:

Soil Amendment Area (SAA) Soil is known to be present at the site. SAA Soil location areas are as shown on the Drawings defined as Special Soil Handling Area. Contractor will excavate, grade and manage location of SAA Soil, but remediation is not required. Removal of the SAA Soil from the site is not allowed.

SC-5.06. Add the following language following Paragraph 5.06.A.2:

3. The following reports or drawings regarding Hazardous Environmental Conditions at the Site are known to Owner:

5.06.A.3.a. Report dated January 29, 2024 prepared by (Radian Consulting Group, LLC, 806 Wells Avenue S.E., Huntsville, AL 35801, entitled “ Technical Memorandum Radiation Sources and Remedial Actions for the SAA Property in Millersburg, OR” consisting of 8 pages. The “technical data” contained in such report upon which Contractor may rely is for the Soil Amendment Area.

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SC-6.01. Add the following language after Paragraph 6.01.A:

Provide the following additional bond:

6.01.A.1. Contractor's Public Works Bond:

6.01.A.1.a. Public works bond in the amount of \$30,000 in accordance with the requirements of ORS 279C.836.

SC-6.02. Add the following new paragraph immediately after Paragraph 6.02.A:

6.02.A.1. Surety and insurance companies from which the bonds and insurance for this Project are purchased shall have an A.M. Best's rating of no less than VII, in addition to other requirements specified herein.

SC-6.03. Add the following new paragraph immediately following Paragraph 6.03.A.4:

6.03.A.5. The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

6.03.A.5.a. Workers' Compensation and related coverages under Paragraph 6.03.A.1 and Paragraph 6.03.A.3 of the General Conditions:

6.03.A.5.a.1. State: Statutory.

6.03.A.5.a.2. Applicable Federal (e.g., Longshoreman's): Statutory.

SC-6.03.B. Add the following new paragraphs immediately after Paragraph 6.03.B:

6.03.C. Workers Compensation:

6.03.C.1. In accordance with ORS 279C.530, Contractor shall promptly, as due, make payment to any entity furnishing care incident to sickness or injury, to employees of Contractor, of all sums which Contractor agrees to pay for such care and all moneys which Contractor deducted from the wages of employees pursuant to any law, contract, or agreement for the purpose of providing or paying for such service.

6.03.C.2. Contractor and Subcontractors that employ workers who work under this Contract in the State of Oregon shall comply with ORS 656.017 and provide required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. Contractor shall ensure that each of its Subcontractors complies with these requirements.

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SC-6.03. Add the following new paragraph immediately following Paragraph 6.03.C.8:

6.03.C.9. Contractor's General Liability under Paragraph 6.03.B. and Paragraph 6.03.C of the General Conditions which shall eliminate the exclusion with respect to property under the care, custody and control of Contractor:

6.03.C.9.a. General Aggregate	\$2,000,000
6.03.C.9.b. Products – Completed Operations Aggregate	\$2,000,000
6.03.C.9.c. Personal and Advertising Injury (per person/Organization)	\$1,000,000
6.03.C.9.d. Each Occurrence (Bodily Injury and Property Damage)	\$1,000,000
6.03.C.9.e. Property Damage liability insurance will provide Explosion, Collapse, and Underground coverages where applicable.	

SC-6.03. Add the following new paragraph immediately following Paragraph 6.03.D:

6.03.D.1. Contractor's Automobile Liability

6.03.D.1.a. Combined Single Limit of	\$1,000,000
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SC-6.03. Add the following new paragraph immediately following Paragraph 6.03.E:

6.03.E.1. Excess or Umbrella Liability:

a) General Aggregate	\$5,000,000
b) Each Occurrence	\$1,000,000

SC-6.03. Add the following language after Paragraph 6.03.G:

6.03.G.1. Include the following parties or entities as additional insured:

6.03.G.1.a. City of Millersburg, 4222 NE Old Salem Road, Millersburg, Oregon 97321.

6.03.G.1.b. Jacobs Engineering Group Inc, 1100 NE Circle Blvd, Suite 300, Corvallis, Oregon, 97330.

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SC-6.05. Insert the following paragraph after 6.05.A.1:

6.05.A.1.a. In addition to the individuals and entities specified in Paragraph 6.05.A.1, include as insureds, the following:

6.05.A.1.a.1) Jacobs Engineering Group Inc;

6.05.A.2.a. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued; and

6.05.A.2.b. Comply with the requirements of Paragraph 6.05.A of the General Conditions.

SC-6.05. Add the following language as Paragraph 6.05.A.15:

6.05.A.15. Property insurance furnished under this Contract shall have deductibles no greater than \$10,000 for direct physical loss in any one occurrence for sublimits except for earthquake, which shall have a maximum deductible of \$50,000.

SC-7.02. Add the following language at the end of Paragraph 7.02.B:

In accordance with ORS 279C.520, no person shall be employed for more than 10 hours in any 1 day, or 40 hours in any 1 week, except in cases of necessity, emergency, or where the public policy absolutely requires it. In such cases, the person so employed shall be paid at least time and a half the person's regular rate of pay for all time worked in excess of 40 hours in one week; when work week is 8 hours for 5 consecutive days or 10 hours for 4 consecutive days, and for time worked on Saturday and on any legal holiday specified in ORS 279C.540.

SC-7.02. Add the following new paragraph immediately after Paragraph 7.02.B:

7.02.C. Contractor shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

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SC-7.02.C. Add the following new subparagraph immediately after Paragraph 7.02.C:

7.02.C.1. For purposes of administering the foregoing requirement, additional overtime costs are defined as Owner's actual cost.

SC-7.05. Add the following language at the end of Paragraph 7.05.D:

Reimbursement rates for Engineer or their officers, directors, members, partners, employees, agents, and other consultants and subcontractors for evaluation of proposed substitutes shall be on the basis established in Paragraph 15.01.E. of these Supplementary Conditions.

SC-7.06. Add the following language at the end of Paragraph 7.06.A:

Contractor shall perform a minimum of 10 percent of the onsite labor with its own employees.

SC-7.08. Add the following new paragraphs immediately after Paragraph 7.08.A:

7.08.B. Owner will obtain and pay for the following construction permits and licenses:

7.08.B.1. Oregon DEQ 1200-C Permit (TBD).

7.08.B.2. U.S. Army Corps of Engineers (USACE) Rivers and Harbors Act Section 10/Clean Water Act (CWA) Section 404 (TBD).

7.08.B.3. USACE National Historic Preservation Act Section 106 Compliance (TBD).

7.08.B.4. Oregon Department of State Lands Removal-Fill Permit (DSL No. 64515-RF).

7.08.B.5. Oregon Department of Environmental Quality (DEQ) CWA Section 401 Water Quality Certification (DEQ Water Quality Certification TBD).

7.08.C. A copy of each permit is in Volume 4 Permits and Authorizations. Contractor shall examine the permits and conform to the requirements contained therein, including the purchase of additional bonds or insurance as specified therein, and such requirements are hereby made a part of these Contract Documents as fully and completely as though the same were set forth herein. Failure to examine the permit(s) will not relieve Contractor from compliance with the requirements stated therein. Within 10 days after the date of signing the Agreement, Contractor shall confer with an agent of the permitting agency so that insurance requirements and similar matters can be arranged prior to the time set for that portion of the Work.

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SC-7.10. Add the following new paragraph(s) immediately after Paragraph 7.10.C:

7.10.D. While not intended to be inclusive of all Laws or Regulations for which Contractor may be responsible under Paragraph 7.10, the following Laws or Regulations are included as mandated by statute or for the convenience of Contractor:

7.10.D.1. Prevailing Wage Rates:

7.10.D.1.a. In accordance with ORS 279C.800 through 279C.870, concerning payment of not less than prevailing wage rates; each worker in each trade or occupation employed in the performance of the Work under these Contract Documents, either by Contractor, Subcontractor, or other person doing or contracting to do the whole or any part of the Work, shall be paid not less than the applicable prevailing wage rates included in the Contract Documents.

7.10.D.1.b. Owner will pay the Commissioner of the Bureau of Labor and Industries the fee required by ORS 279C.825.

7.10.D.1.c. Current Prevailing Wage Information: Applicable edition of Oregon BOLI rates (and amendment, if applicable) as of advertisement date:

<https://www.oregon.gov/boli/employers/pages/prevailing-wage-rates.aspx>.

7.10.D.2. Discrimination: In accordance with ORS 279A.110, Contractor will not be discriminated against minority, women, or emerging small business in obtaining required subcontracts.

7.10.D.3. In accordance with ORS 279C.505, Contractor shall demonstrate that an employee drug testing program is in place.

7.10.D.4. ORS 654.150 applies at the Construction Site. All costs incurred in complying with state statutes requiring sanitation facilities shall be borne by Contractor.

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7.10.D.5. Environmental Pollution:

7.10.D.5.a. In accordance with ORS 279C.525, as amended, specific reference is made to those federal, state and local agencies that have enacted ordinances or regulations dealing with the prevention of environmental pollution and the preservation of natural resources that affect the performance of the Work:

7.10.D.5.a.(1). Oregon Department of Environmental Quality (ODEQ).

7.10.D.7. Workers employed by Contractor shall not be able to collect for unpaid overtime unless a claim is filed in accordance with ORS 279C.545 with Contractor.

7.10.D.8. Person claiming not being paid in full for supplied labor or materials for performance of the Work has right to file notice of such claim. Notice shall be filed in accordance with ORS 279C.605.

SC-7.18. Add the following new paragraphs immediately after Paragraph 7.18.C:

7.18.D. Contractor shall indemnify, defend, save, and hold harmless State of Oregon, the Oregon Transportation Commission and its members, the Department of Transportation, their officers, agents and employees from and against any and all claims, actions, liabilities, damages, losses, or expenses, including attorneys' fees, arising from a tort, as now or hereafter defined in ORS 30.260, caused, or alleged to be caused, in whole or in part, by the negligent or willful acts or omissions of Contractor or any of its officers, agents, employees or subcontractors ("Claims"). It is the specific intention of the Parties that ODOT shall, in all instances, except for Claims arising solely from the negligent or willful acts or omissions of ODOT, be indemnified by Contractor from and against any and all Claims.

7.18.E. Contractor, nor any attorney engaged by Contractor shall defend any claim in the name of ODOT or any agency of the State of Oregon, nor purport to act as legal representative of the State of Oregon or any of its agencies, without the prior written consent of the Oregon Attorney General. The State may, at any time at its election, assume its own defense and settlement in the event that it determines that Contractor is prohibited from defending the State, or that Contractor is not adequately defending the State's interests, or that an important governmental principle is at issue or that it is in the best interests of the State to do so. The State reserves all rights to pursue claims it may have against Contractor if the State of Oregon elects to assume its own defense.

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SC-10.03. Add the following new paragraphs immediately after Paragraph 10.03.A:

10.03.B. Resident Project Representative (RPR) will be furnished by Engineer. The responsibilities, authority, and limitations of the RPR are limited to those of Engineer in accordance with Paragraph 10.08 and as set forth elsewhere in the Contract Documents and are further limited and described below.

10.03.C. Responsibilities and Authority:

10.03.C.1. Schedules: Review and monitor Progress Schedule, Schedule of Submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.

10.03.C.2. Conferences and Meetings: Conduct or attend meetings with Contractor, such as preconstruction conferences, progress meetings, Work conferences and other Project related meetings.

10.03.C.3. Liaison: (i) Serve as Engineer's liaison with Contractor, working principally through Contractor's authorized representative, and assist in understanding the intent of the Contract Documents; (ii) assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's onsite operations; (iii) assist in obtaining from Owner additional details or information when required for proper execution of the Work.

10.03.C.4. Interpretation of Contract Documents: Inform Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.

10.03.C.5. Submittals: Receive submittals that are furnished at the Site by Contractor, and notify Engineer of availability for examination. Advise Engineer and Contractor of the commencement of any Work or arrival of materials and equipment at Site, when recognized, requiring a Shop Drawing or Sample if the submittal has not been approved by Engineer.

10.03.C.6. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and provide recommendations to Engineer; transmit to Contractor, in writing decisions as issued by Engineer.

10.03.C.7. Review of Work and Rejection of Defective Work: (i) Conduct onsite observations of the Work in progress to assist Engineer in determining if the Work is, in general, proceeding in accordance with the Contract Documents; (ii) inform Engineer and Contractor whenever RPR believes that any Work is defective; (iii) advise Engineer whenever RPR believes that any Work will not produce a completed Project that conforms generally to the

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Contract Documents or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged or does not meet the requirements of any inspection test, or approval required to be made; and advise Engineer of that part of the Work in progress that RPR believes should be corrected or rejected or uncovered for observation, or requires special testing, inspection, or approval.

10.03.C.8. Inspections, Tests, and System Startups: (i) Verify tests, equipment and systems startups and operating and maintenance training are conducted in the presence of appropriate personnel, and that Contractor maintains adequate records thereof; (ii) observe, record, and report to Engineer appropriate details relative to the test procedures and system startups; and (iii) accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections, and report to Engineer.

10.03.C.9. Records: (i) Maintain records for use in preparing Project documentation; (ii) keep a diary or log book recording pertinent Site conditions, activities, decisions and events; (iii) record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of Contractors, Subcontractors, and major Suppliers of materials and equipment.

10.03.C.10. Reports: (i) Furnish Engineer periodic reports of progress of the Work and of Contractor's compliance with the Progress Schedule and Schedule of Submittals; (ii) immediately notify Engineer of the occurrence of Site accidents, emergencies, acts of God endangering the Work, damage to property by fire or other causes, or the discovery of any Hazardous Environmental Condition; and (iii) assist Engineer in drafting proposed Change Orders, Work Change Directives, and Field Orders; obtain backup material from Contractor as appropriate.

10.03.C.11. Payment Requests: Review Applications for Payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

10.03.C.12. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify materials and equipment certificates and operation and maintenance manuals and other data required by Specifications to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these

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documents been delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

10.03.C.13. Completion: (i) Participate in a Substantial Completion inspection; assist in determination of Substantial Completion and the preparation of lists of items to be completed or corrected; (ii) Participate in a final inspection in the company of Engineer, Owner, and Contractor and prepare a final list of items to be completed and deficiencies to be remedied; and (iii) observe whether items on final list have been completed or corrected, and make recommendations to Engineer concerning acceptance.

10.03.D. Limitations of Authority: Resident Project Representative will not:

10.03.D.1. have authority to authorize a deviation from Contract Documents or substitution of materials or equipment, unless authorized by Engineer; or

10.03.D.2. exceed the limitations of Engineer's authority as set forth in Contract Documents; or

10.03.D.3. undertake any of the responsibilities of Contractor, Subcontractors, Suppliers, or Contractor's authorized representative; or

10.03.D.4. advise on, issue directions relative to, or assume control over an aspect of the means, methods, techniques, sequences, or procedures of Contractor's work unless such advice or directions are specifically required by the Contract Documents; or

10.03.D.5. advise on, issue directions regarding, or assume control over safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor; or

10.03.D.6. participate in specialized field or laboratory tests or inspections conducted offsite by others, except as specifically authorized by Engineer; or

10.03.D.7. accept Shop Drawings or Samples from anyone other than Contractor; or

10.03.D.8. authorize Owner to occupy the Project in whole or in part.

SC-10.08. Add the following new paragraph immediately after Paragraph 10.08.E:

10.08.F. Contractors, Subcontractors, Suppliers, and others on the Project, or their sureties, shall maintain no direct action against Engineer, its officers, employees, affiliated corporations, and subcontractors, for any Claim arising out of, in connection

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with, or resulting from the engineering services performed. Only the Owner will be the beneficiary of any undertaking by Engineer.

SC-11.04. Add the following new paragraph immediately after Paragraph 11.04.C:

11.04.D. In the event Contractor submits request for additional compensation as a result of a change or differing Site conditions, or as a result of delays, acceleration, or loss of productivity, Owner reserves right, upon written request, to audit and inspect Contractor's books and records relating to the Project. Upon written request for an audit, Contractor shall make its books and records available within 14 days of request. Owner shall specifically designate identity of auditor. As part of audit, Contractor shall make available its books and records relating to the Project, including but not limited to Bidding Documents, cost reports, payroll records, material invoices, subcontracts, purchase orders, daily timesheets, and daily diaries. Audit shall be limited to those cost items which are sought by Contractor in a change order or claim submission to Owner.

SC-13.01. Delete Paragraph 13.01.B.5.c in its entirety and insert the following in its place:

13.01.B.5.c. Construction Equipment and Machinery:

13.01.B.5.c.(1) Rentals of construction equipment and machinery, and the parts thereof in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. Such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

13.01.B.5.c.(2) Costs for equipment and machinery owned by Contractor will be paid at a rate shown for such equipment in the Rental Rate Blue Book published by Equipment Watch. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs. Costs will include the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of such equipment or machinery, or parts thereof, shall cease to accrue when the use thereof is no longer necessary for the changed Work. Equipment or machinery with a value of less than \$1,000 will be considered small tools.

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SC-13.01. Add the following language to the end of Paragraph 13.01.B.5.h:

Express and courier services must be approved prior to use.

SC-13.03. Add the following language after Paragraph 13.03.E.3:

13.03.E.4. The unit price of an item of Unit Price Work shall be subject to re-evaluation and adjustment under the following conditions:

13.03.E.4.a. if the Bid price of a particular item of Unit Price Work amounts to 5 percent or more of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than 15 percent from the estimated quantity of such item indicated in the Agreement; and

13.03.E.4.b. if there is no corresponding adjustment with respect to any other item of Work; and

13.03.E.4.c. if Contractor believes that Contractor has incurred additional expense as a result thereof or if Owner believes the quantity variation entitles Owner to an adjustment in the unit price, either Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Article 10 if the parties are unable to agree as to the effect of any such variation in the quantity of Unit Price Work performed.

SC-14.02. Delete Paragraph 14.02.B in its entirety and insert the following in its place:

14.02.B. Contractor shall retain an independent testing laboratory or testing agency and shall be responsible for arranging and shall pay for specified tests, inspections, and approvals, including tests, inspections, and approvals to be paid for on a cash allowance basis, required for Owner's and Engineer's acceptance of the Work at the Site except:

14.02.B.1. costs incurred in connection with tests or inspections pursuant to Paragraph 14.02.C shall be paid for as provided in said paragraph; and

14.02.B.2. as otherwise specifically provided in the Contract Documents.

SC-14.02. Add the following language at the end of Paragraph 14.02.D:

Tests required by Contract Documents to be performed by Contractor that require test certificates be submitted to Owner or Engineer for acceptance shall be made by an independent testing laboratory or agency licensed or certified in accordance with Laws and Regulations and applicable state and local statutes. In the event state license

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or certification is not required, testing laboratories or agencies shall meet the following applicable requirements:

14.02.D.6. Basic requirements of ASTM E329, “Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection” as applicable.

14.02.D.7. Calibrate testing equipment at reasonable intervals by devices of accuracy, traceable to the National Institute of Standards and Technology or accepted values of natural physical constants.

SC-15.01. Delete Paragraph 15.01.D.1 in its entirety and insert the following in its place:

15.01.D.1. Twenty days after presentation of the Application for Payment to Owner with Engineer’s recommendation, the amount recommended will (subject to the provisions of Paragraph 15.01.E.) become due and when due will be paid by Owner to Contractor.

SC-15.01.E Add the following new paragraph immediately after Paragraph 15.01.E.1.a.l:

15.01.E.1.m. Overtime worked by Contractor necessitating Engineer, and their officers, directors, members, partners, employees, agents, and other consultants and subcontractors of each, Resident Project Representative or Resident Project Representative’s Site staff, if any, to work extraordinary overtime in accordance with Paragraph 7.02.C. of these Supplementary Conditions. For purposes of administering this requirement, additional extraordinary overtime costs are defined as Owner’s costs.

SC-15.01. Add the following new paragraphs immediately after Paragraph 15.01.E:

15.01.F. Subcontractor Payments:

15.01.F.1. In accordance with ORS 279C.505, Contractor shall: (i) make payment promptly, as due to all persons supplying to Contractor, labor or material for the prosecution of the Work under these Contract Documents, (ii) pay all contributions or amounts due the Industrial Accident Fund from Contractor or Subcontractor incurred in the performance of the Work, (iii) not permit any lien or Claim to be filed or prosecuted against Owner, on account of labor or material furnished, and (iv) pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

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15.01.F.2. In accordance with ORS 279C.515:

15.01.F.2.a. If Contractor fails, neglects, or refuses to make prompt payment to Subcontractors or Suppliers of any Claim as such Claim becomes due, Owner may pay such Claim and charge the amount of the payment against funds due Contractor. The payment of a Claim in the manner authorized shall not relieve Contractor or Contractor's surety from obligation with respect to any unpaid Claims.

15.01.F.2.b. If Contractor or first-tier Subcontractor fails, neglects, or refuses to make payments within 30 days after receipt of payment from Owner, Contractor or first-tier Subcontractor shall owe amount due plus interest charges commencing at the end of the 10-day period that payment is due and ending upon payment.

15.01.F.2.c. If Contractor or first-tier Subcontractor fails, neglects, or refuses to make payments to person furnishing labor or materials, person may file a complaint with the Construction Contractors Board.

15.01.F.3. In accordance with ORS 279C.580:

15.01.F.3.a. Contractor shall include in each subcontract for property or services entered in to by Contractor or first-tier Subcontractor, including material Suppliers, for the purpose of performing Work under this Contract, a clause that obligates Contractor to pay first-tier Subcontractor for satisfactory performance under its subcontract within 10 days out of such amounts as are paid to Contractor by Owner.

15.01.F.3.b. Contractor shall include in each subcontract a clause that obligates Contractor to pay first-tier Subcontractor an interest penalty of three times the discount rate on 90-day commercial paper in effect at the Federal Reserve Bank in the Federal Reserve district that includes Oregon on the date that is 30 days after the date when payment was received from Owner, but the rate of interest shall not exceed 30 percent. The amount of interest may not be waived.

15.01.F.3.c. Contractor shall require first-tier Subcontractors to included same clauses in subcontracts with lower tiered Subcontractors and Suppliers in connection with this Project.

SC 15.03.B. Add the following new subparagraph to Paragraph 15.03.B:

SC 15.03.B.1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living

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expenses, shall be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

SC-15.06.A.2. Add the following new paragraph immediately after Paragraph 15.06.A.2:

15.06.A.2.e. In accordance with ORS 279A.120, when out-of-state Contractor is awarded a Contract, Contractor is required to report to the Department of Revenue the Contract Price, terms of payment, length of Contract, and other information as Department of Revenue may require. Owner will verify Contractor has satisfied this requirement prior to issuing final payment.

SC-17.02. Add the following new paragraph immediately after Paragraph 17.01.

SC-17.02 Arbitration

SC-17.02.A. All matters subject to final resolution under this Article will be decided by arbitration in accordance with the rules of the State of Oregon, subject to the conditions and limitations of this paragraph. This agreement to arbitrate and any other agreement or consent to arbitrate entered into will be specifically enforceable under the prevailing law of any court having jurisdiction.

SC-17.02.B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitrator or arbitration provider, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in this Article, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations. The demand for arbitration should include specific reference to Paragraph SC-17.02.D below.

SC-17.02.C. No arbitration arising out of or relating to the Contract shall include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:

SC-17.02.C.1. the inclusion of such other individual or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and

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SC-17.02.C.2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings.

SC-17.02.D. The award rendered by the arbitrator(s) shall be consistent with the agreement of the parties, in writing, and include a concise breakdown of the award, and a written explanation of the award specifically citing the Contract provisions deemed applicable and relied on in making the award.

SC-17.02.E. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.

SC-17.02.F. The fees and expenses of the arbitrators and any arbitration service shall be shared equally by Owner and Contractor.

17.02.F. The fees and expenses of the arbitrators and any arbitration service shall be shared equally by Owner and Contractor.

SC-17.03. Add the following new paragraph immediately after Paragraph 17.02:

SC-17.03 Attorneys' Fees and Costs: For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys' fees and costs (including expert witness fees and court reporter fees) incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

END OF SECTION

PART 3

SPECIFICATIONS

**SECTION 01 11 00
SUMMARY OF WORK**

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

- A. The completed Work will provide Owner with approximately 4,000 feet of arterial roadway, grading, potable water distribution main, stormwater piping, irrigation, landscaping and approximately 10 acres of linear park. The park will include approximately 2,350 feet of retaining wall, grading, landscaping, irrigation, stormwater piping, a multi-use path, park lighting, plazas with seat walls and incidentals.
- B. The Work is divided into the following schedules:
1. Schedule A: Approximately 1,000 feet of arterial roadway, grading, potable water distribution main, stormwater piping, irrigation, landscaping approximately 4 acres of linear park, landscaping, irrigation, and sediment and erosion control.
 2. Schedule B: Approximately 1,200 feet of potable water distribution main and sediment and erosion control.
 3. Schedule C: Approximately 2,700 feet of arterial roadway, grading, potable water distribution main, stormwater piping, irrigation, landscaping approximately 6 acres of linear park, landscaping, irrigation, and sediment and erosion control.
- C. Alternates:
1. Only those material alternates that were selected by the Owner, as evidenced in the Agreement, are made a part of this Contract.
 2. Schedule A:
 - a. Alternates that were Bid are as described below:
 - 1) Alternate No. 1: In lieu of the Stone Terra Ridgestone retaining wall, construct the retaining wall from UltraBlock Cut Stone.
 - 2) Alternate No. 2: In lieu of the Stone Terra Ridgestone retaining wall, construct the retaining wall from UltraBlock Quarry Stone.
 - 3) Alternate No. 3: In lieu of the Stone Terra Ridgestone retaining wall, construct the retaining wall from gabion baskets.

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3. Schedule C:
 - a. Alternates that were Bid are as described below:
 - 1) Alternate No. 1: In lieu of the Stone Terra Ridgestone retaining wall, construct the retaining wall from UltraBlock Cut Stone.
 - 2) Alternate No. 2: In lieu of the Stone Terra Ridgestone retaining wall, construct the retaining wall from UltraBlock Quarry Stone.
 - 3) Alternate No. 3: In lieu of the Stone Terra Ridgestone retaining wall, construct the retaining wall from gabion baskets.
- D. Provisions for future construction are as shown and as follows:
 1. Casings for future utilities.
 2. Street lighting by Pacific Power.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.01 PROPOSAL REQUESTS

- A. Owner may, in anticipation of ordering an addition, deletion, or revision to the Work, request Contractor to prepare a detailed proposal of cost and times to perform contemplated change.
- B. Proposal request will include reference number for tracking purposes and detailed description of and reason for proposed change, and such additional information as appropriate and as may be required for Contractor to accurately estimate cost and time impact on Project.
- C. Proposal request is for information only; Contractor is neither authorized to execute proposed change nor to stop Work in progress as result of such request.
- D. Contractor's written proposal shall be transmitted to Engineer promptly, but not later than 14 days after Contractor's receipt of Owner's written request. Proposal shall remain firm for a maximum period of 45 days after receipt by Engineer.
- E. Owner's request for proposal or Contractor's failure to submit such proposal within the required time period will not justify a Claim for an adjustment in Contract Price or Contract Times (or Milestones).

1.02 CLAIMS

- A. Include, at a minimum:
 - 1. Specific references including (i) Drawing numbers, (ii) Specification section and article/paragraph number, and (iii) Submittal type, Submittal number, date reviewed, Engineer's comment, as applicable, with appropriate attachments.
 - 2. Stipulated facts and pertinent documents, including photographs and statements.
 - 3. Interpretations relied upon.
 - 4. Description of (i) nature and extent of Claim, (ii) who or what caused the situation, (iii) impact to the Work and work of others, and (iv) discussion of claimant's justification for requesting a change to price or times or both.

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5. Estimated adjustment in price claimant believes it is entitled to with full documentation and justification.
6. Requested Change in Contract Times: Include at least (i) Progress Schedule documentation showing logic diagram for request, (ii) documentation that float times available for Work have been used, and (iii) revised activity logic with durations including sub-network logic revisions, duration changes, and other interrelated schedule impacts, as appropriate.
7. Documentation as may be necessary as set forth below for Work Change Directive, and as Engineer may otherwise require.

1.03 WORK CHANGE DIRECTIVES

A. Procedures:

1. Engineer will:
 - a. Initiate, including a description of the Work involved and any attachments.
 - b. Affix signature, demonstrating Engineer's recommendation.
 - c. Transmit an electronic copy to Owner for authorization.
2. Owner will:
 - a. Affix signature, demonstrating approval of the changes involved.
 - b. Return an electronic copy to Engineer, who will retain a copy, send a copy to the Resident Project Representative or other field representative, and forward a copy to Contractor.
3. Upon completion of Work covered by the Work Change Directive or when final Contract Times and Contract Price are determined, Contractor shall submit documentation for inclusion in a Change Order.
4. Contractor's documentation shall include but not be limited to:
 - a. Appropriately detailed records of Work performed to enable determination of value of the Work.
 - b. Full information required to substantiate resulting change in Contract Times and Contract Price for Work. On request of Engineer, provide additional data necessary to support documentation.
 - c. Support data for Work performed on a unit price or Cost of the Work basis with additional information such as:
 - 1) Dates Work was performed, and by whom.
 - 2) Time records, wage rates paid, and equipment rental rates.
 - 3) Invoices and receipts for materials, equipment, and subcontracts, all similarly documented.

- B. Effective Date of Work Change Directive: Date of signature by Owner, unless otherwise indicated thereon.

1.04 CHANGE ORDERS

A. Procedure:

1. Engineer will prepare an electronic copy of proposed Change Order and transmit such with Engineer's written recommendation and request to Contractor for signature.
2. Contractor shall, upon receipt, either: (i) promptly sign copies, retaining one for its file, and return an electronic copy to Engineer for Owner's signature, or (ii) return unsigned electronic copy with written justification for not executing Change Order.
3. Engineer will, upon receipt of Contractor signed copy, promptly forward Engineer's written recommendation and partially executed electronic copy for Owner's signature, or if Contractor fails to execute the Change Order, Engineer will promptly so notify Owner and transmit Contractor's justification to Owner.
4. Upon receipt of Contractor-executed Change Order, Owner will promptly either:
 - a. Execute Change Order, retaining an electronic copy for its file and returning an electronic copy to Engineer.
 - b. Return to Engineer unsigned electronic copy with written justification for not executing Change Order.
5. Upon receipt of Owner-executed Change Order, Engineer will transmit an electronic copy to Contractor, an electronic copy to Resident Project Representative or other field representative, and retain an electronic copy, or if Owner fails to execute the Change Order, Engineer will promptly so notify Contractor and transmit Owner's justification to Contractor.
6. Upon receipt of Owner-executed Change Order, Contractor shall:
 - a. Perform Work covered by Change Order.
 - b. Revise Schedule of Values to adjust Contract Price and submit with next Application for Payment.
 - c. Revise Progress Schedule to reflect changes in Contract Times, if any, and to adjust times for other items of Work affected by change.
 - d. Enter changes in Project record documents after completion of change related Work.

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- B. In signing a Change Order, Owner and Contractor acknowledge and agree that:
1. Stipulated compensation (Contract Price or Contract Times, or both) set forth includes payment for (i) the Cost of the Work covered by the Change Order, (ii) Contractor's fee for overhead and profit, (iii) interruption of Progress Schedule, (iv) delay and impact, including cumulative impact, on other Work under the Contract Documents, and (v) extended overheads.
 2. Change Order constitutes full mutual accord and satisfaction for the change to the Work.
 3. Unless otherwise stated in the Change Order, all requirements of the original Contract Documents apply to the Work covered by the Change Order.
- C. Deferred Award Schedule C: For the Bidder that is awarded the Contract, Bid Price for Schedule C shall remain valid for a period of up to 245 days following Bid Opening. Owner may choose to exercise a Deferred Award Schedule C during this same 245-day period. For the Deferred Award Schedule C, Unit Prices for all Bid Items except Bid Items 2 and 4 will be factored at the time of Award by the Engineering News Record, Construction Cost Index 20 City Average (ENR-CCI20) in accordance with the following formula.
1. Factored Deferred Award Schedule C Price = Schedule C Bid Price * [ENR-CCI20 (month prior to Bid Alternate Award)]/[ENR-CCI20 (Month of Bid Opening)].

1.05 COST OF THE WORK

- A. In determining the supplemental costs allowed in Paragraph 13.01.B.5 of the General Conditions for rental equipment and machinery, the following will apply.
- B. Rental of construction equipment and machinery and the parts thereof having a replacement value in excess of \$1,000, whether owned by Contractor or rented or leased from others, shall meet the following requirements:
1. Full rental costs for leased equipment shall not exceed rates listed in the Rental Rate Blue Book published by Equipment Watch, as adjusted to the regional area of the Project. Owned equipment costs shall not exceed the single shift rates established in the Cost Reference Guide (CRG) published by Equipment Watch. The most recent published edition in effect at commencement of actual equipment use shall be used.

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2. Rates shall apply to equipment in good working condition. Equipment not in good condition, or larger than required, may be rejected by Engineer or accepted at reduced rates.
3. Leased Equipment:
 - a. For equipment leased or rented in arm's length transactions from outside vendors, maximum rates shall be determined by the following actual usage/Payment Category:
 - 1) Less than 8 hours: Hourly rate.
 - 2) 8 or more hours but less than 7 days: Daily rate.
 - 3) 7 or more days but less than 30 days: Weekly rate.
 - 4) 30 days or more: Monthly rate.
4. Arm's length rental and lease transactions are those in which the firm involved in the rental or lease of equipment is not associated with, owned by, have common management, directorship, facilities and/or stockholders with the firm renting the equipment.
5. Financial arrangements associated with rental and lease transactions that provide Contractor remuneration or discounts not visible to the Owner must be disclosed and integrated with charged rates.
6. Leased Equipment in Use: Actual equipment use time documented by Engineer shall be the basis that equipment was on and utilized at the Project Site. In addition to the leasing rate above, equipment operational costs shall be paid at the estimated hourly operating cost rate set forth in the Rental Rate Blue Book if not already included in the lease rate. Hours of operation shall be based upon actual equipment usage to the nearest quarter hour, as recorded by Engineer.
7. Leased Equipment, When Idle (Standby): Idle or standby equipment is equipment onsite or in transit to and from the Work Site and necessary to perform the Work under the modification, but not in actual use. Idle equipment time, as documented by Engineer, shall be paid at the leasing rate determined above, excluding operational costs.
8. Owned and Other Equipment in Use: Equipment rates for owned equipment or equipment provided in other than arm's length transaction shall not exceed the single shift total hourly costs rate developed in accordance with the CRG and as modified herein for multiple shifts. This total hourly rate will be paid for each hour the equipment actually performs work. Hours of operation shall be based upon actual equipment usage as recorded by Engineer. This rate shall represent payment in full for Contractor's direct costs.
9. Owned and Other Equipment, When Idle (Standby): Equipment necessary to be onsite to perform the Work on single shift operations, but not utilized, shall be paid for at the ownership hourly expense rate developed in accordance with the CRG, provided its presence and necessity onsite has been documented by Engineer. Payment for idle time of portions of a normal workday, in conjunction with original

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contract Work, will not be allowed. In no event shall idle time claimed in a day for a particular piece of equipment exceed the normal Work or shift schedule established for the Project. It is agreed that this rate shall represent payment in full for Contractor's direct costs. When Engineer determines that the equipment is not needed to continuously remain at the Work Site, payment will be limited to actual hours in use.

10. Owned and Other Equipment, Multiple Shifts: For multiple shift operations, the CRG single shift total hourly costs rate shall apply to the operating equipment during the first shift. For subsequent shifts, up to two in a 24-hour day, operating rate shall be the sum of the total hourly CRG operating cost and 60 percent of the CRG ownership and overhaul expense. Payment for idle or standby time for second and third shifts shall be 20 percent of the CRG ownership and overhaul expense.
11. When necessary to obtain owned equipment from sources beyond the Project limits, the actual cost to transfer equipment to the Site and return it to its original location will be allowed as an additional item of expense. Move-in and move-out allowances will not be made for equipment brought to the Project if the equipment is also used on original Contract or related Work.
12. If the move-out destination is not to the original location, payment for move-out will not exceed payment for move-in.
13. If move is made by common carrier, the allowance will be the amount paid for the freight. If equipment is hauled with Contractor's own forces, rental will be allowed for the hauling unit plus the hauling unit operator's wage. If equipment is transferred under its own power, the rental will be 75 percent of the appropriate total hourly costs for the equipment, without attachments, plus the equipment operator's wage.
14. Charges for time utilized in servicing equipment to ready it for use prior to moving and similar charges will not be allowed.
15. When a breakdown occurs on any piece of owned equipment, payment shall cease for that equipment and any other owned equipment idled by the breakdown.
16. If any part of the Work is shut down by Owner, standby time will be paid during nonoperating hours if diversion of equipment to other Work is not practicable. Engineer reserves the right to cease standby time payment when an extended shutdown is anticipated.
17. If a rate has not been established in the CRG for owned equipment, Contractor may:
 - a. If approved by Engineer, use the rate of the most similar model found, considering such characteristics as manufacturer, capacity, horsepower, age, and fuel type.

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- b. Request Equipment Watch to furnish a written response for a rate on the equipment, which shall be presented to Engineer for approval.
- c. Request Engineer to establish a rate.

1.06 FIELD ORDER

- A. Engineer will issue Field Orders, with three copies to Contractor.
- B. Effective date of the Field Order shall be the date of signature by Engineer, unless otherwise indicated thereon.
- C. Contractor shall acknowledge receipt by signing and returning one copy to Engineer.
- D. Field Orders will be incorporated into subsequent Change Orders, as a no-cost change to the Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 29 00
PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SUBMITTALS

- A. Informational Submittals:
1. Schedule of Values: Submit on Contractor's standard form. Submit at least 7 days prior to preconstruction conference.
 2. Schedule of Estimated Progress Payments:
 - a. Submit with initially acceptable Schedule of Values.
 - b. Submit adjustments thereto with Application for Payment.
 3. Application for Payment.
 4. Final Application for Payment.

1.02 SCHEDULE OF VALUES

- A. Prepare a separate Schedule of Values for each schedule of the Work under the Agreement.
- B. Upon request of Engineer, provide documentation to support the accuracy of the Schedule of Values.
- C. Unit Price Work: Reflect unit price quantity and price breakdown from conformed Bid Form.
- D. Lump Sum Work:
1. Prepare a Schedule of Values for each Lump Sum Bid Item
 2. Reflect specified alternates, as applicable.
 3. List bonds and insurance premiums, mobilization, demobilization, preliminary and detailed progress schedule preparation, equipment testing, facility startup, and contract closeout separately.
 - a. Mobilization includes, at minimum, items identified in Section 01 50 00, Temporary Facilities and Controls.
 - b. Include item(s) for monthly progress schedule update and maintenance of Engineer's trailer.
 4. Break down by Standard Specification Sections with appropriate subdivision of each specification.
 5. Schedule of Values shall group work separately for Right-of-Way and Linear Park elements.

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- E. An unbalanced or front-end loaded schedule will not be acceptable.
- F. Summation of the complete Schedule of Values representing all the Work shall equal the Contract Price.
- G. Submit Schedule of Values in a spreadsheet format compatible with latest version of MSExcel.
- H. Mobilization shall not exceed 5 percent of the total contract value.
- I. Demobilization shall not be less than 2 percent of the total contract value.

1.03 SCHEDULE OF ESTIMATED PROGRESS PAYMENTS

- A. Show estimated payment requests throughout Contract Times aggregating initial Contract Price.
- B. Base estimated progress payments on initially acceptable progress schedule. Adjust to reflect subsequent adjustments in progress schedule and Contract Price as reflected by modifications to the Contract Documents.

1.04 APPLICATION FOR PAYMENT

- A. Transmittal Summary Form: Attach one Summary Form with each detailed Application for Payment for each schedule and include Request for Payment of Materials and Equipment on Hand as applicable. Execute certification by authorized officer of Contractor.
- B. Use detailed Application for Payment Form provided by Engineer.
- C. Provide separate form for each schedule as applicable.
- D. Include accepted Schedule of Values for each schedule or portion of lump sum Work and the unit price breakdown for the Work to be paid on a unit priced basis.
- E. Include separate line item for each Change Order and Work Change Directive executed prior to date of submission. Provide further breakdown of such as requested by Engineer.

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- F. Preparation:
 - 1. Round values to nearest dollar.
 - 2. Submit Application for Payment, including a Transmittal Summary Form and detailed Application for Payment Form(s) for each schedule as applicable, a listing of materials on hand for each schedule as applicable, and such supporting data as may be requested by Engineer.

1.05 MEASUREMENT—GENERAL

- A. Weighing, measuring, and metering devices used to measure quantity of materials for Work shall be suitable for purpose intended and conform to tolerances and specifications as specified in National Institute of Standards and Technology, Handbook 44.
- B. Whenever pay quantities of material are determined by weight, weigh material on scales furnished by Contractor and certified accurate by state agency responsible. Obtain weight or load slip from weigher and deliver to Owner’s representative at point of delivery of material.
- C. If material is shipped by rail, car weights will be accepted provided that actual weight of material only will be paid for and not minimum car weight used for assessing freight tariff, and provided further that car weights will not be acceptable for material to be passed through mixing plants.
- D. Vehicles used to haul material being paid for by weight shall be weighed empty daily and at such additional times as required by Engineer. Each vehicle shall bear a plainly legible identification mark.
- E. Haul materials that are specified for measurement by the cubic yard measured in the vehicle in transport vehicles of such type and size that actual contents may be readily and accurately determined. Unless all vehicles are of uniform capacity, each vehicle must bear a plainly legible identification mark indicating its water level capacity. Load vehicles to at least their water level capacity. Loads hauled in vehicles not meeting above requirements or loads of a quantity less than the capacity of the vehicle, measured after being leveled off as above provided, will be subject to rejection, and no compensation will be allowed for such material.
- F. Units of measure shown on Bid Form shall be as follows, unless specified otherwise.

Item	Method of Measurement
TON	Ton—Weight Measure by Scale (2,000 pounds)

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1.06 PAYMENT

- A. Payment for Lump Sum Work shown or specified in Contract Documents is included in the Contract Price. Payment will be based on a percentage complete basis for each line item of the accepted Schedule of Values, unless covered as a unit price.
- B. Payment for unit price items covers all the labor, materials, and services necessary to furnish and install the following items.

Item	Description
HMAC Base Course and Wearing Course	As defined in Section 304 of the Standard Specifications with the exception of Asphalt Cement binder.
PG 64-22 Asphalt Cement in HMAC Base Course	As defined in Section 205.02.01 of the Standard Specifications.
PG 70-22 Asphalt Cement in HMAC Base Course	As defined in Section 205.02.01 of the Standard Specifications.

- C. Asphalt Cement Material Price Escalation/De-escalation – An asphalt cement escalation/de-escalation clause will be in effect during the life of the Contract.
 - 1. Monthly Asphalt Cement Material Price (MACMP) – The MACMP will be established by ODOT each month. For information regarding the calculation of the MACMP, and for the actual MACMP, go to the ODOT website at: <https://www.oregon.gov/odot/business/pages/asphalt-fuel-price.aspx>
 - 2. If the ODOT index ceases to be available for any reason, the City in its discretion will select and begin using a substitute price source or index to establish the MACMP each month. The MACMP will apply to all asphalt cement including but not limited to paving grade, polymer modified, and emulsified asphalts, and recycling agents. The City does not guarantee that asphalt cement will be available at the MACMP
 - 3. Base Asphalt Cement Material Price (Bases): The Base asphalt cements material price for this Project is the MACMP published on the ODOT website for the month immediately preceding the bid opening date.

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4. Monthly Asphalt Cement Adjustment Factor: The Monthly Asphalt Cement Adjustment Factor will be determined each month as follows:
 - a. If the MACMP is within plus or minus 5 percent of the Base, there will be no adjustment.
 - b. If the MACMP is more than 105 percent of the Base, then:
Adjustment Factor = (MACMP)-(1.05 x Base).
 - c. If the MACMP is less than 95 percent of the Base, then:
Adjustment Factor = (MACMP)-(0.95 x Base).
5. Asphalt Cement Price Adjustment: A price adjustment will be made for the items containing asphalt cement listed below. The price adjustment as calculated in 1.1.4.4 above will use the MACMP for the month the asphalt is incorporated into the Project. The price adjustment will be determined by multiplying the asphalt incorporated during the month for subject Pay Items by the Adjustment Factor.
 - a. The Pay Items for which price adjustments will be made are:
 - 1) PG 64-22 Asphalt Cement in HMAC Base Course.
 - 2) PG 70-22 Asphalt Cement in HMAC Wearing Course.

1.07 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Payment will not be made for following:

1. Loading, hauling, and disposing of rejected material.
2. Quantities of material wasted or disposed of in manner not called for under Contract Documents.
3. Rejected loads of material, including material rejected after it has been placed by reason of failure of Contractor to conform to provisions of Contract Documents.
4. Material not unloaded from transporting vehicle.
5. Defective Work not accepted by Owner.
6. Material remaining on hand after completion of Work.

1.08 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

- A. Partial Payment: No partial payments will be made for materials and equipment delivered or stored unless Shop Drawings and preliminary operation and maintenance data is acceptable to Engineer.
- B. Final Payment: Will be made only for products incorporated in Work; remaining products, for which partial payments have been made, shall revert to Contractor unless otherwise agreed, and partial payments made for those items will be deducted from final payment.

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PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 13
PROJECT COORDINATION

PART 1 GENERAL

1.01 SUBMITTALS

A. Informational:

1. Statement of Qualification (SOQ) for land surveyor or civil engineer.
2. Video Recordings: Submit one USB Drive within 10 days of Substantial Completion.

1.02 UTILITY NOTIFICATION AND COORDINATION

A. Coordinate the Work with various utilities within Project limits. Notify applicable utilities prior to commencing Work, if damage occurs, or if conflicts or emergencies arise during the Work.

1. Pacific Power Electricity Company:
 - a. Contact Person: Eddie Steiner.
 - b. Telephone: (541) 967-6146.
2. CenturyLink Telephone Company:
 - a. Contact Person: Alexis Cutler
 - b. Telephone: (805) 719-6882.
3. City of Albany Water Department:
 - a. Contact Person: Matt Thompson.
 - b. Telephone: (541) 791-0048.
4. NW Natural Gas:
 - a. Contact Person: David Van Der Haeghen.
 - b. Telephone: (541) 731-8587.
5. City of Millersburg Public Works Department:
 - a. Contact Person: Janelle Booth.
 - b. Telephone: (458) 233-6302.
6. Comcast: Communications.
 - a. Contact Person: Chris Cranford.
 - b. Telephone: (503) 476-2477.
7. Lumen: Fiber.
 - a. Contact Person: Travis Vaughn.
 - b. Telephone: (971) 346-4141.
8. LS Networks: Fiber.
 - a. Contact Person: Rick Rappe.
 - b. Telephone: (503) 302-7298.

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1.03 PROJECT MILESTONES

- A. General: Include the Milestones specified herein as a part of the Progress Schedule required under Section 01 32 00, Construction Progress Documentation.
- B. Project Milestones: Generally described in the Agreement Form.
1. Following is a detailed description of each:
- a. Milestone 1:
 - 1) Schedule A: Transition Parkway STA 39+31.71 to STA 40+81.71.
 - a) Prerequisites: Notice to Proceed.
 - b) Milestone Completion Guideline: All work required to complete Transition Parkway through finish course HMAC including subsurface utilities is completed by August 29, 2025.
 - b. Milestone 2:
 - 1) Schedule A: Potable Waterline STA 37+17.11 to STA 40+81.71.
 - a) Prerequisites: Notice to Proceed.
 - b) Milestone Completion Guideline: All work required to have the potable waterline in service, including disinfection and commissioning is completed by August 29, 2025.
 - c. Milestone 3:
 - 1) Schedule B: Substantial Completion.
 - a) Prerequisites: Notice to Proceed.
 - b) Milestone Completion Guideline: All work required to have the potable waterline in service, including disinfection and commissioning is completed by June 9, 2025.
 - d. Milestone 4:
 - 1) Schedule A: Substantial Completion.
 - a) Milestone Completion Guideline: All work is Substantially Complete by September 12, 2025.
 - e. Milestone 5:
 - 1) Schedule A and Schedule B: Final Completion.
 - a) Prerequisites: Milestone 4.
 - b) Milestone Completion Guideline: All work required to have the potable waterline in service, including disinfection and commissioning is completed by October 17, 2025.

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- f. Milestone 6:
 - 1) Schedule C: Substantial Completion.
 - a) Milestone Completion Guideline: All work is Substantially Complete by April 24, 2026.
- g. Milestone 7:
 - 1) Schedule C: Final Completion.
 - a) Prerequisites: Milestone 7.
 - b) Milestone Completion Guideline: All work required to have the potable waterline in service, including disinfection and commissioning is completed by May 29, 2026.

1.04 WORK SEQUENCING/CONSTRAINTS

A. Include the following work sequences in the Progress Schedule:

- 1. Woods Road Intersection with Conser Road and Transition Parkway: Contractor shall maintain through traffic. The max allowable delay is 20 minutes. Contractor shall notify the City Engineer in writing at least 72 hours in advance.
- 2. Seasonally oversized farm equipment on Conser Road and Woods Road, May through October. When minimum 18-foot width cannot pass through the Woods Road, Conser Road, Transition Parkway intersection work area, provide detour route signage to Old Salem Road via Millersburg Drive.
- 3. Vehicular Access:
 - a. Construction Traffic shall not use Conser Road. All Construction traffic shall access the site from the existing segment of Transition Parkway.
 - b. Before starting Work at the Woods Road and Conser Road Intersection:
 - 1) Conser Road extension shall be ready for vehicular traffic with a minimum of base lift of HMAC pavement.
 - 2) Castillo Extension shall be ready for vehicular traffic with a minimum of a base lift of HMAC pavement.
 - c. Existing Pacific Power Access from Conser Road cannot be removed before new access from Transition Parkway is ready for vehicular traffic with a minimum of a base lift of HMAC pavement.
 - d. Contractor shall be able to provide vehicular access to residential properties at all times. If temporary blockage of 2573 Conser Road and 2581 Conser Road is required, it shall be approved in writing by the City Engineer a minimum 72 hours ahead of time.

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4. Working hours 7 a.m. to 7 p.m., without authorization in writing from the City Engineer.
5. Special Soil Handling Area Excavation and Grading:
 - a. Excavation spoil must stay within the identified boundaries.
 - b. Excavation spoil cannot be removed from the Site.
 - c. Excavation spoil from other Project areas cannot be stored within the Special Soil Handling area.
 - d. Excavation Spoil from other project areas can be used as permanent fill within the Special Soil Handling Area after Special Soil Handling Area excavation spoil has been used completely, if required.

1.05 FACILITY OPERATIONS

- A. Continuous operation of Owner's facilities is of critical importance. Schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified.
- B. Perform Work continuously during critical connections and changeovers, and as required to prevent interruption of Owner's operations.
- C. When necessary, plan, design, and provide various temporary services, utilities, connections, temporary piping, access, and similar items to maintain continuous operations of Owner's facility.
- D. Do not close lines, open or close valves, or take other action which would affect the operation of existing systems, except as specifically required by the Contract Documents and after authorization by Owner and Engineer. Such authorization will be considered within 48 hours after receipt of Contractor's written request.
- E. Construct Work in the following stages to allow for Owner's continuous occupancy and for uninterrupted operation during construction.
 1. Transition Parkway shall be open for vehicular traffic before the portion of Conser Road can be demolished, as shown on the Drawings.
- F. Relocation of Existing Facilities:
 1. During construction, it is expected that minor relocations of Work will be necessary.
 2. Provide complete relocation of existing structures and Underground Facilities, including piping, utilities, equipment, structures, electrical conduit wiring, electrical duct bank, and other necessary items.

3. Use only new materials for relocated facility. Match materials of existing facility, unless otherwise shown or specified.
4. Perform relocations to minimize downtime of existing facilities.
5. Install new portions of existing facilities in their relocated position prior to removal of existing facilities, unless otherwise accepted by Engineer.

1.06 ADJACENT FACILITIES AND PROPERTIES

A. Examination:

1. After Effective Date of the Agreement and before Work at Site is started, Contractor, Engineer, and affected property owners and utility owners shall make a thorough examination of pre-existing conditions including existing buildings, structures, and other improvements in vicinity of Work, as applicable, which could be damaged by construction operations.
2. Periodic reexamination shall be jointly performed to include, but not limited to, cracks in structures, settlement, leakage, and similar conditions.

1.07 REFERENCE POINTS AND SURVEYS

A. Owner's Responsibilities:

1. Establish bench marks convenient to Work as shown on the Drawings.
2. Establish horizontal reference points or coordinate system with bench marks and reference points for Contractor's use as necessary to lay out Work.

B. Location and elevation of benchmarks are shown on Drawings.

C. Contractor's Responsibilities:

1. Provide additional survey and layout required to layout the Work.
2. Check and establish exact location of existing facilities prior to construction of new facilities and any connections thereto.
3. Retain professional land surveyor or civil engineer registered in state of Project who shall perform or supervise engineering surveying necessary for additional construction staking and layout.
4. Maintain complete accurate log of survey work as it progresses as a Record Document.
5. On request of Engineer, submit documentation.

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6. Provide competent employee(s), tools, stakes, and other equipment and materials as Engineer may require to:
 - a. Establish control points, lines, and easement boundaries.
 - b. Check layout, survey, and measurement work performed by others.
 - c. Measure quantities for payment purposes.
7. Establish clearing limits, centerlines of roads and pipelines, set toe of fill and top of cut stakes, set grade hubs on minimum 50-foot stations for subgrade, base course, and surfacing and set bench marks convenient for use as necessary to establish basic layout of the Work.
8. For gravity pipelines or sewer lines over 500-feet in length, set offset stakes indicating cut-to-flow line at each manhole or alignment change, 25 feet each side of manhole or alignment change and at approximate 200-foot intervals along line.
9. For pressure pipelines over 500 feet in length, set offset stakes indicating locations of pipelines at approximate 200-foot intervals along line and indicate depth of cut when required.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 CUTTING, FITTING, AND PATCHING

- A. Cut, fit, adjust, or patch Work and work of others, including excavation and backfill as required, to make Work complete.
- B. Refinish surfaces to provide an even finish.
 1. Refinish continuous surfaces to nearest intersection.
 2. Refinish entire assemblies.
 3. Finish restored surfaces to such planes, shapes, and textures that no transition between existing work and the Work is evident in finished surfaces.
- C. Restore existing work, Underground Facilities, and surfaces that are to remain in completed Work including concrete-embedded piping, conduit, and other utilities as specified and as shown on Drawings.
- D. Make restorations with new materials and appropriate methods as specified for new Work of similar nature; if not specified, use recommended practice of manufacturer or appropriate trade association.

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- E. Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces and fill voids.
- F. Remove specimens of installed Work for testing when requested by Engineer.

END OF SECTION

SECTION 01 31 19
PROJECT MEETINGS

PART 1 GENERAL

1.01 GENERAL

- A. Contractor shall schedule physical arrangements for meetings throughout progress of the Work, prepare meeting agenda with regular participant input and distribute with written notice of each meeting, preside at meetings, record minutes to include significant proceedings and decisions, and reproduce and distribute copies of minutes within 5 days after each meeting to participants and parties affected by meeting decisions.

1.02 PRECONSTRUCTION CONFERENCE

- A. Contractor shall be prepared to discuss the following subjects, as a minimum:

1. Required schedules.
2. Status of Bonds and insurance.
3. Sequencing of critical path work items.
4. Progress payment procedures.
5. Project changes and clarification procedures.
6. Use of Site, access, office and storage areas, security and temporary facilities.
7. Major product delivery and priorities.
8. Contractor's safety plan and representative.

- B. Attendees will include:

1. Owner's representatives.
2. Contractor's office representative.
3. Contractor's resident superintendent.
4. Contractor's quality control representative.
5. Subcontractors' representatives whom Contractor may desire or Engineer may request to attend.
6. Engineer's representatives.
7. Others as appropriate.

1.03 PROGRESS MEETINGS

- A. Engineer will schedule regular progress meetings at Site, conducted weekly to review the Work progress, Progress Schedule, Schedule of Submittals,

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Application for Payment, contract modifications, and other matters needing discussion and resolution.

B. Attendees will include:

1. Owner's representative(s), as appropriate.
2. Contractor, Subcontractors, and Suppliers, as appropriate.
3. Engineer's representative(s).
4. Others as appropriate.

1.04 QUALITY CONTROL MEETINGS

A. Scheduled by Engineer on regular basis and as necessary to review test and inspection reports, and other matters relating to quality control of the Work and work of other Contractors.

B. Attendees will include:

1. Contractor.
2. Contractor's designated quality control representative.
3. Subcontractors and Suppliers, as necessary.
4. Engineer's representatives.

1.05 PREINSTALLATION MEETINGS

A. When required in individual Specification sections, convene at Site prior to commencing the Work of that section.

B. Require attendance of entities directly affecting, or affected by, the Work of that section.

C. Notify Engineer 4 days in advance of meeting date.

D. Provide suggested agenda to Engineer to include reviewing conditions of installation, preparation and installation or application procedures, and coordination with related Work and work of others.

1.06 OTHER MEETINGS

A. In accordance with Contract Documents and as may be required by Owner and Engineer.

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PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 SUBMITTALS

A. Informational Submittals:

1. Preliminary Progress Schedule: Submit at least 7 days prior to preconstruction conference.
2. Detailed Progress Schedule:
 - a. Submit initial Detailed Progress Schedule within 30 days after Effective Date of the Agreement.
 - b. Submit an Updated Progress Schedule at each update, in accordance with Article Detailed Progress Schedule.
3. Submit with Each Progress Schedule Submission:
 - a. Contractor's certification that Progress Schedule submission is actual schedule being used for execution of the Work.
 - b. Electronic file compatible with latest version of Microsoft Excel, PDF or other software approved by Engineer.
4. Prior to final payment, submit a final Updated Progress Schedule.

1.02 PRELIMINARY PROGRESS SCHEDULE

- A. In addition to basic requirements outlined in General Conditions, show a detailed schedule, beginning with Notice to Proceed, for minimum duration of 120 days, and a summary of balance of Project through Final Completion.
- B. Show activities including, but not limited to the following:
 1. Notice to Proceed.
 2. Permits.
 3. Submittals, with review time. Contractor may use Schedule of Submittals specified in Section 01 33 00, Submittal Procedures.
 4. Early procurement activities for long lead equipment and materials.
 5. Initial Site work.
 6. Earthwork.
 7. Specified Work sequences and construction constraints.
 8. Contract Completion Dates.
 9. Major structural, mechanical, equipment, electrical, architectural, and control Work.
 10. System startup summary.

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11. Project close-out summary.
 12. Demobilization summary.
- C. Update Preliminary Progress Schedule monthly as part of progress payment process. Failure to do so may result in the Owner withholding all or part of the monthly progress payment until the Preliminary Progress Schedule is updated in a manner acceptable to Engineer.
- D. Format: In accordance with Article Progress Schedule—Bar Chart.

1.03 DETAILED PROGRESS SCHEDULE

- A. In addition to requirements of General Conditions, submit Detailed Progress Schedule beginning with Notice to Proceed and continuing through Final Completion.
- B. Show the duration and sequences of activities required for complete performance of the Work reflecting means and methods chosen by Contractor.
- C. When accepted by Engineer, Detailed Progress Schedule will replace Preliminary Progress Schedule and become Baseline Schedule. Subsequent revisions will be considered as Updated Progress Schedules.
- D. Format: In accordance with Article Progress Schedule—Bar Chart.
- E. Update monthly to reflect actual progress and occurrences to date, including weather delays.

1.04 PROGRESS SCHEDULE—BAR CHART

- A. General: Comprehensive bar chart schedule, generally as outlined in Associated General Contractors of America (AGC) 580, “Construction Project Planning and Scheduling Guidelines.” If a conflict occurs between the AGC publication and this specification, this specification shall govern.
- B. Format:
1. Unless otherwise approved, white paper, 11-inch by 17-inch sheet size.
 2. Title Block: Show name of Project and Owner, date submitted, revision or update number, and name of scheduler.
 3. Identify horizontally, across the top of the schedule, the time frame by year, month, and day.
 4. Identify each activity with a unique number and a brief description of the Work associated with that activity.
 5. Legend: Describe standard and special symbols used.

C. Contents:

1. Identify, in chronological order, those activities reasonably required to complete the Work, including as applicable, but not limited to:
 - a. Obtaining permits, submittals for early product procurement, and long lead time items.
 - b. Mobilization and other preliminary activities.
 - c. Initial Site work.
 - d. Specified Work sequences, constraints, and Milestones, including Substantial Completion date(s).
 - e. Subcontract Work.
 - f. Major equipment design, fabrication, factory testing, and delivery dates.
 - g. Delivery dates for Owner-furnished products, as specified in Section 01 11 00, Summary of Work.
 - h. Sitework.
 - i. Concrete Work.
 - j. Structural steel Work.
 - k. Architectural features Work.
 - l. Conveying systems Work.
 - m. Equipment Work.
 - n. Mechanical Work.
 - o. Electrical Work.
 - p. Instrumentation and control Work.
 - q. Interfaces with Owner-furnished equipment.
 - r. Other important Work for each major facility.
 - s. Equipment and system startup and test activities.
 - t. Project closeout and cleanup.
 - u. Demobilization.

1.05 PROGRESS OF THE WORK

A. Updated Progress Schedule shall reflect:

1. Progress of Work to within 5 working days prior to submission.
2. Approved changes in Work scope and activities modified since submission.
3. Delays in Submittals or resubmittals, deliveries, or Work.
4. Adjusted or modified sequences of Work.
5. Other identifiable changes.
6. Revised projections of progress and completion.
7. Report of changed logic.

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- B. Produce detailed subschedules during Project, upon request of Owner or Engineer, to further define critical portions of the Work such as facility shutdowns.
- C. If an activity is not completed by its latest scheduled completion date and this failure is anticipated to extend Contract Times (or Milestones), submit, within 7 days of such failure, a written statement as to how nonperformance will be corrected to return Project to acceptable current Progress Schedule. Actions by Contractor to complete the Work within Contract Times (or Milestones) will not be justification for adjustment to Contract Price or Contract Times.
- D. Owner may order Contractor to increase plant, equipment, labor force, or working hours if Contractor fails to:
 - 1. Complete a Milestone activity by its completion date.
 - 2. Satisfactorily execute Work as necessary to prevent delay to overall completion of Project, at no additional cost to Owner.

1.06 NARRATIVE PROGRESS REPORT

- A. Format:
 - 1. Organize same as Progress Schedule.
 - 2. Identify, on a cover letter, reporting period, date submitted, and name of author of report.
- B. Contents:
 - 1. Number of days worked over the period, work force on hand, construction equipment on hand (including utility vehicles such as pickup trucks, maintenance vehicles, stake trucks).
 - 2. General progress of Work, including a listing of activities started and completed over the reporting period, mobilization/demobilization of subcontractors, and major milestones achieved.
 - 3. Contractor's plan for management of Site (for example, lay down and staging areas, construction traffic), use of construction equipment, buildup of trade labor, and identification of potential Contract changes.
 - 4. Identification of new activities and sequences as a result of executed Contract changes.
 - 5. Documentation of weather conditions over the reporting period, and any resulting impacts to the work.
 - 6. Description of actual or potential delays, including related causes, and the steps taken or anticipated to mitigate their impact.
 - 7. Changes to activity logic.
 - 8. Changes to the critical path.

9. Identification of, and accompanying reason for, any activities added or deleted since the last report.
10. Steps taken to recover the schedule from Contractor-caused delays.

1.07 SCHEDULE ACCEPTANCE

A. Engineer's acceptance will demonstrate agreement that:

1. Proposed schedule is accepted with respect to:
 - a. Contract Times, including Final Completion and all intermediate Milestones, are within the specified times.
 - b. Specified Work sequences and constraints are shown as specified.
 - c. Specified Owner-furnished Equipment or Material arrival dates, or range of dates, are included.
 - d. Access restrictions are accurately reflected.
 - e. Startup and testing times are as specified.
 - f. Submittal review times are as specified.
2. In all other respects, Engineer's acceptance of Contractor's schedule indicates that, in Engineer's judgment, schedule represents reasonable plan for constructing Project in accordance with the Contract Documents. Engineer's review will not make any change in Contract requirements. Lack of comment on any aspect of schedule that is not in accordance with the Contract Documents will not thereby indicate acceptance of that change, unless Contractor has explicitly called the nonconformance to Engineer's attention in submittal. Schedule remains Contractor's responsibility and Contractor retains responsibility for performing all activities, for activity durations, and for activity sequences required to construct Project in accordance with the Contract Documents.

B. Unacceptable Preliminary Progress Schedule:

1. Make requested corrections; resubmit within 10 days.
2. Until acceptable to Engineer as Baseline Progress Schedule, continue review and revision process, including updating schedule on a monthly basis to reflect actual progress and occurrences to date.

C. Unacceptable Detailed Progress Schedule:

1. Make requested corrections; resubmit within 10 days.
2. Until acceptable to Engineer as Baseline Progress Schedule, continue review and revision process.

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- D. Narrative Report: All changes to activity duration and sequences, including addition or deletion of activities subsequent to Engineer's acceptance of Baseline Progress Schedule, shall be delineated in Narrative Report current with proposed Updated Progress Schedule.

1.08 ADJUSTMENT OF CONTRACT TIMES

- A. Reference General Conditions and Section 01 26 00, Contract Modification Procedures.
- B. Evaluation and reconciliation of Adjustments of Contract Times shall be based on the Updated Progress Schedule at the time of proposed adjustment or claimed delay.
- C. Schedule Contingency:
 - 1. Contingency, when used in the context of the Progress Schedule, is time between Contractor's proposed Completion Time and Contract Completion Time.
 - 2. Contingency included in Progress Schedule is a Project resource available to both Contractor and Owner to meet Contract Milestones and Contract Times. Use of Schedule contingency shall be shared to the proportionate benefit of both parties.
 - 3. Use of schedule contingency suppression techniques such as preferential sequencing and extended activity times is prohibited.
 - 4. Pursuant to Contingency sharing provisions of this specification, no time extensions will be granted, nor will delay damages be paid until a delay occurs which (i) consumes all available contingency time, and (ii) extends Work beyond the Contract Completion date.
- D. Claims Based on Contract Times:
 - 1. Where Engineer has not yet rendered formal decision on Contractor's Claim for adjustment of Contract Times, and parties are unable to agree as to amount of adjustment to be reflected in Progress Schedule, reflect an interim adjustment in the Progress Schedule as acceptable to Engineer.
 - 2. It is understood and agreed that such interim acceptance will not be binding on either Contractor or Owner, and will be made only for the purpose of continuing to schedule Work until such time as formal decision has been rendered as to an adjustment, if any, of the Contract Times.
 - 3. Revise Progress Schedule prepared thereafter in accordance with Engineer's formal decision.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 DEFINITIONS

- A. Action Submittal: Written and graphic information submitted by Contractor that requires Engineer's approval.
- B. Deferred Submittal: Information in accordance with IBC 2018 submitted by Contractor for portions of design that are to be submitted to permitting agency for approval prior to installation of that portion of the Work, along with Engineer's review documentation that submittal has been found to be in general conformance with Project's design.
- C. Informational Submittal: Information submitted by Contractor that requires Engineer's review and determination that submitted information is in accordance with the Conditions of the Contract.

1.02 PROCEDURES

- A. Direct submittals to Engineer at the following, unless specified otherwise.
 - 1. E-mail: Millersburg-SDC@jacobs.com.
 - a. Note maximum single email size is 25 megabytes.
- B. Electronic Submittals: Submittals shall, unless specifically accepted, be made in electronic format.
 - 1. Each submittal shall be an electronic file in Adobe Acrobat Portable Document Format (PDF). Use the latest version available at time of execution of the Agreement.
 - 2. Electronic files that contain more than 10 pages in PDF format shall contain internal bookmarking from an index page to major sections of the document.
 - 3. PDF files shall be set to open "Bookmarks and Page" view.
 - 4. Add general information to each PDF file, including title, subject, author, and keywords.
 - 5. PDF files shall be set up to print legibly at 8.5-inch by 11-inch, 11-inch by 17-inch, or 22-inch by 34-inch. No other paper sizes will be accepted.
 - 6. Submit new electronic files for each resubmittal.

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7. Include a copy of the Transmittal of Contractor's Submittal form, located at end of section, with each electronic file.
8. Engineer will reject submittal that is not electronically submitted, unless specifically accepted.
9. Provide Engineer with authorization to reproduce and distribute each file as many times as necessary for Project documentation.
10. Detailed procedures for handling electronic submittals will be discussed at the preconstruction conference.

C. Transmittal of Submittal:

1. Contractor shall:
 - a. Review each submittal and check for compliance with Contract Documents.
 - b. Stamp each submittal with uniform approval stamp before submitting to Engineer.
 - 1) Stamp to include Project name, submittal number, Specification number, Contractor's reviewer name, date of Contractor's approval, and statement certifying submittal has been reviewed, checked, and approved for compliance with Contract Documents.
 - 2) Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
2. Complete, sign, and transmit with each submittal package, one Transmittal of Contractor's Submittal form attached at end of this section.
3. Identify each submittal with the following:
 - a. Numbering and Tracking System:
 - 1) Sequentially number each submittal.
 - 2) Resubmission of submittal shall have original number with sequential alphabetic suffix.
 - b. Specification section and paragraph to which submittal applies.
 - c. Project title and Engineer's project number.
 - d. Date of transmittal.
 - e. Names of Contractor, Subcontractor or Supplier, and manufacturer as appropriate.
4. Identify and describe each deviation or variation from Contract Documents.

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- D. Format:
1. Do not base Shop Drawings on reproductions of Contract Documents.
 2. Package submittal information by individual specification section. Do not combine different specification sections together in submittal package, unless otherwise directed in specification.
 3. Present in a clear and thorough manner and in sufficient detail to show kind, size, arrangement, and function of components, materials, and devices, and compliance with Contract Documents.
 4. Index with labeled tab dividers in orderly manner.
- E. Timeliness: Schedule and submit in accordance Schedule of Submittals and requirements of individual specification sections.
- F. Processing Time:
1. Time for review shall commence on Engineer's receipt of submittal.
 2. Engineer will act upon Contractor's submittal and transmit response to Contractor not later than 30 days after receipt, unless otherwise specified.
 3. Resubmittals will be subject to same review time.
 4. No adjustment of Contract Times or Price will be allowed as a result of delays in progress of Work caused by rejection and subsequent resubmittals.
- G. Resubmittals: Clearly identify each correction or change made.
- H. Incomplete Submittals:
1. Engineer will return entire submittal for Contractor's revision if preliminary review deems it incomplete.
 2. When any of the following are missing, submittal will be deemed incomplete:
 - a. Contractor's review stamp; completed and signed.
 - b. Transmittal of Contractor's Submittal; completed and signed.
 - c. Insufficient number of copies.
- I. Submittals not required by Contract Documents:
1. Will not be reviewed and will be returned stamped "Not Subject to Review."
 2. Engineer will keep one copy and return submittal to Contractor.

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1.03 ACTION SUBMITTALS

- A. Prepare and submit Action Submittals required by individual specification sections.
- B. Shop Drawings:
 - 1. Full Size PDF documents.
 - 2. Identify and Indicate:
 - a. Applicable Contract Drawing and Detail number, products, units and assemblies, and system or equipment identification or tag numbers.
 - b. Equipment and Component Title: Identical to title shown on Drawings.
 - c. Critical field dimensions and relationships to other critical features of Work. Note dimensions established by field measurement.
 - d. Project-specific information drawn accurately to scale.
 - 3. Manufacturer's standard schematic drawings and diagrams as follows:
 - a. Modify to delete information that is not applicable to the Work.
 - b. Supplement standard information to provide information specifically applicable to the Work.
 - 4. Product Data: Provide as specified in individual specifications.
 - 5. Deferred Submittal: See Drawings for list of deferred submittals.
 - a. Contractor-design drawings and product data related to permanent construction.
 - 1) Written and graphic information.
 - 2) Drawings.
 - 3) Cut sheets.
 - 4) Data sheets.
 - 5) Action item submittals requested in individual specification section.
 - b. Prior to installation of indicated structural or nonstructural element, equipment, distribution system, or component or its anchorage, submit required supporting data and drawings for review and acceptance by Engineer. Documentation of review and approval provided on Engineer's comment form, along with completed submittal, shall be filed with permitting agency by Contractor and approved by permitting agency prior to installation.
 - 6. Foreign Manufacturers: When proposed, include names and addresses of at least two companies that maintain technical service representatives close to Project.

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C. Samples:

1. Two, unless otherwise specified in individual specifications.
2. Preparation:
 - a. Mount, display, or package Samples in manner specified to facilitate review of quality. Attach label on unexposed side that includes the following:
 - 1) Manufacturer name.
 - 2) Model number.
 - 3) Material.
 - 4) Sample source.
3. Manufacturer's Color Chart: Units or sections of units showing full range of colors, textures, and patterns available.
4. Full-size Samples:
 - a. Size as indicated in individual specification section.
 - b. Prepared from same materials to be used for the Work.
 - c. Cured and finished in manner specified.
 - d. Physically identical with product proposed for use.

D. Action Submittal Dispositions: Engineer will review, comment, stamp, and distribute as noted:

1. Approved:
 - a. Contractor may incorporate product(s) or implement Work covered by submittal.
 - b. Distribution: Electronic.
 - 1) Owner.
 - 2) Resident Project Representative.
 - 3) Engineer's file.
 - 4) Returned to Contractor appropriately annotated.
2. Approved as Noted:
 - a. Contractor may incorporate product(s) or implement Work covered by submittal, in accordance with Engineer's notations.
 - b. Distribution: Electronic.
 - 1) Owner.
 - 2) Resident Project Representative.
 - 3) Engineer's file.
 - 4) Returned to Contractor appropriately annotated.
3. Partial Approval, Resubmit as Noted:
 - a. Make corrections or obtain missing portions, and resubmit.
 - b. Except for portions indicated, Contractor may begin to incorporate product(s) or implement Work covered by submittal, in accordance with Engineer's notations.

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- c. Distribution: Electronic.
 - 1) Owner.
 - 2) Resident Project Representative.
 - 3) Engineer's file.
 - 4) Returned to Contractor appropriately annotated.
- 4. Revise and Resubmit:
 - a. Contractor may not incorporate product(s) or implement Work covered by submittal.
 - b. Distribution: Electronic.
 - 1) Owner.
 - 2) Resident Project Representative.
 - 3) Engineer's file.
 - 4) Returned to Contractor appropriately annotated.

1.04 INFORMATIONAL SUBMITTALS

A. General:

- 1. Refer to individual specification sections for specific submittal requirements.
- 2. Engineer will review each submittal. If submittal meets conditions of the Contract, Engineer will forward copy to appropriate parties. If Engineer determines submittal does not meet conditions of the Contract and is therefore considered unacceptable, Engineer will retain one copy and return remaining copy with review comments to Contractor, and require that submittal be corrected and resubmitted.

B. Certificates:

- 1. General:
 - a. Provide notarized statement that includes signature of entity responsible for preparing certification.
 - b. Signed by officer or other individual authorized to sign documents on behalf of that entity.
- 2. Welding: In accordance with individual specification sections.
- 3. Installer: Prepare written statements on manufacturer's letterhead certifying installer complies with requirements as specified in individual specification section.
- 4. Material Test: Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
- 5. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by Laws and Regulations or governing agency or specified in individual specification sections.

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6. Manufacturer's Certificate of Compliance.
 7. Manufacturer's Certificate of Proper Installation: In accordance with Section 01 43 33, Manufacturers' Field Services.
- C. Construction Photographs and Video: In accordance with Section 01 31 13, Project Coordination, and as may otherwise be required in Contract Documents.
- D. Closeout Submittals: In accordance with Section 01 77 00, Closeout Procedures.
- E. Contractor-design Data (related to temporary construction):
1. Written and graphic information.
 2. List of assumptions.
 3. List of performance and design criteria.
 4. Summary of loads or load diagram, if applicable.
 5. Calculations.
 6. List of applicable codes and regulations.
 7. Name and version of software.
 8. Information requested in individual specification section.
- F. Deferred Submittals: See Drawings for list of deferred submittals.
1. Contractor-design data related to permanent construction:
 - a. List of assumptions.
 - b. List of performance and design criteria.
 - c. Summary of loads or load diagram, if applicable.
 - d. Calculations.
 - e. List of applicable codes and regulations.
 - f. Name and version of design software.
 - g. Factory test results.
 - h. Informational submittals requested in individual specification section.
 2. Prior to installation of indicated structural or nonstructural element, equipment, distribution system, or component or its anchorage, submit calculations and test results of Contractor-designed components for review by Engineer. Documentation of review and indication of compliance with general design intent and project criteria provided on Engineer's comment form as meets conditions of the Contract, along with completed submittal, shall be filed with permitting agency by Contractor and approved by permitting agency prior to installation.

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- G. Manufacturer's Instructions: Written or published information that documents manufacturer's recommendations, guidelines, and procedures in accordance with individual specification section.
- H. Operation and Maintenance Data: Provide Manufacturers operation and maintenance information in PDF format on a USB thumb drive.
- I. Payment:
 - 1. Application for Payment: In accordance with Section 01 29 00, Payment Procedures.
 - 2. Schedule of Values: In accordance with Section 01 29 00, Payment Procedures.
 - 3. Schedule of Estimated Progress Payments: In accordance with Section 01 29 00, Payment Procedures.
- J. Schedules:
 - 1. Schedule of Submittals: Prepare separately or in combination with Progress Schedule as specified in Section 01 32 00, Construction Progress Documentation.
 - a. Show for each, at a minimum, the following:
 - 1) Specification section number.
 - 2) Identification by numbering and tracking system as specified under Paragraph Transmittal of Submittal.
 - 3) Estimated date of submission to Engineer, including reviewing and processing time.
 - b. On a monthly basis, submit updated Schedule of Submittals to Engineer if changes have occurred or resubmittals are required.
 - 2. Progress Schedules: In accordance with Section 01 32 00, Construction Progress Documentation.
- K. Special Guarantee: Supplier's written guarantee as required in individual specification sections.
- L. Statement of Qualification: Evidence of qualification, certification, or registration as required in Contract Documents to verify qualifications of professional land surveyor, engineer, materials testing laboratory, specialty Subcontractor, trade, Specialist, consultant, installer, and other professionals. Reference Paragraph 1.01.A.38.b of Supplementary Conditions for definition of Specialist.

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- M. Submittals Required by Laws, Regulations, and Governing Agencies:
1. Promptly submit promptly notifications, reports, certifications, payrolls, and otherwise as may be required, directly to the applicable federal, state, or local governing agency or their representative.
 2. Transmit to Engineer for Owner's records one copy of correspondence and transmittals (to include enclosures and attachments) between Contractor and governing agency.
- N. Test, Evaluation, and Inspection Reports:
1. General: Shall contain signature of person responsible for test or report.
 2. Factory:
 - a. Identification of product and specification section, type of inspection or test with referenced standard or code.
 - b. Date of test, Project title and number, and name and signature of authorized person.
 - c. Test results.
 - d. If test or inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.
 - e. Provide interpretation of test results, when requested by Engineer.
 - f. Other items as identified in individual specification sections.
 3. Field:
 - a. As a minimum, include the following:
 - 1) Project title and number.
 - 2) Date and time.
 - 3) Record of temperature and weather conditions.
 - 4) Identification of product and specification section.
 - 5) Type and location of test, Sample, or inspection, including referenced standard or code.
 - 6) Date issued, testing laboratory name, address, and telephone number, and name and signature of laboratory inspector.
 - 7) If test or inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.
 - 8) Provide interpretation of test results, when requested by Engineer.
 - 9) Other items as identified in individual specification sections.
- O. Training Data: In accordance with Section 01 43 33, Manufacturers' Field Services.

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1.05 SUPPLEMENT

A. The supplement listed below, following “End of Section,” is part of this specification:

1. Transmittal of Contractor’s Submittal.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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TRANSMITTAL OF CONTRACTOR'S SUBMITTAL (ATTACH TO EACH SUBMITTAL)			
DATE: _____			
TO: _____ _____ _____ _____ FROM: _____ <div style="text-align: center;">Contractor</div> _____ _____ _____	Submittal No.: _____ <input type="checkbox"/> New Submittal <input type="checkbox"/> Resubmittal Project: _____ Project No.: _____ Specification Section No.: _____ (Cover only one section with each transmittal) Schedule Date of Submittal: _____		
SUBMITTAL TYPE:	<input type="checkbox"/> Shop Drawing	<input type="checkbox"/> Sample	<input type="checkbox"/> Informational
	<input type="checkbox"/> Deferred		

The following items are hereby submitted:

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Spec. and Para. No.	Drawing or Brochure Number	Contains Variation to Contract	
				No	Yes

Contractor hereby certifies that (i) Contractor has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies.

By: _____
Contractor (Authorized Signature)

SECTION 01 43 33
MANUFACTURERS' FIELD SERVICES

PART 1 GENERAL

1.01 DEFINITIONS

- A. Person-Day: One person for 8 hours within regular Contractor working hours.

1.02 SUBMITTALS

- A. Informational Submittals:

1. Training Schedule: Submit, in accordance with requirements of this Specification, not less than 21 days prior to start of equipment installation and revise as necessary for acceptance.
2. Lesson Plan: Submit, in accordance with requirements of this Specification, proposed lesson plan not less than 21 days prior to scheduled training and revise as necessary for acceptance.
3. Training Session Recordings: Furnish Owner with two complete sets of recordings fully indexed and cataloged with printed label stating session and date recorded.

1.03 QUALIFICATION OF MANUFACTURER'S REPRESENTATIVE

- A. Authorized representative of the manufacturer, factory trained, and experienced in the technical applications, installation, operation, and maintenance of respective equipment, subsystem, or system, with full authority by the equipment manufacturer to issue the certifications required of the manufacturer. Additional qualifications may be specified in the individual specification section.
- B. Representative subject to acceptance by Owner. No substitute representatives will be allowed unless prior written approval by such has been given.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 FULFILLMENT OF SPECIFIED MINIMUM SERVICES

- A. Furnish manufacturers' services, when required by an individual specification section, to meet the requirements of this section.

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- B. Where time is necessary in excess of that stated in the Specifications for manufacturers' services, or when a minimum time is not specified, time required to perform specified services shall be considered incidental.
- C. Schedule manufacturer' services to avoid conflict with other onsite testing or other manufacturers' onsite services.
- D. Determine, before scheduling services, that conditions necessary to allow successful testing have been met.
- E. Only those days of service approved by Engineer will be credited to fulfill specified minimum services.
- F. When specified in individual specification sections, manufacturer's onsite services shall include:
 - 1. Assistance during product (system, subsystem, or component) installation to include observation, guidance, instruction of Contractor's assembly, erection, installation or application procedures.
 - 2. Inspection, checking, and adjustment as required for product (system, subsystem, or component) to function as warranted by manufacturer and necessary to furnish Manufacturer's Certificate of Proper Installation.
 - 3. Providing, on a daily basis, copies of manufacturers' representatives field notes and data to Owner.
 - 4. Revisiting the Site as required to correct problems and until installation and operation are acceptable to Engineer.
 - 5. Resolution of assembly or installation problems attributable to or associated with respective manufacturer's products and systems.
 - 6. Assistance during functional and performance testing, and facility startup and evaluation.
 - 7. Training of Owner's personnel in the operation and maintenance of respective product as required.

3.02 MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

- A. When so specified, a Manufacturer's Certificate of Proper Installation form, a copy of which is attached to this section, shall be completed and signed by equipment manufacturer's representative.
- B. Such form shall certify signing party is a duly authorized representative of manufacturer, is empowered by manufacturer to inspect, approve, and operate their equipment and is authorized to make recommendations required to ensure equipment is complete and operational.

3.03 TRAINING

A. General:

1. Furnish manufacturers' representatives for detailed classroom and hands-on training to Owner's personnel on operation and maintenance of specified product (system, subsystem, component) and as may be required in applicable Specifications.
2. Furnish trained, articulate personnel to coordinate and expedite training, to be present during training coordination meetings with Owner, and familiar with operation and maintenance manual information.
3. Manufacturer's representative shall be familiar with facility operation and maintenance requirements as well as with specified equipment.
4. Furnish complete training materials, to include operation and maintenance data, to be retained by each trainee.

B. Training Schedule:

1. List specified equipment and systems that require training services and show:
 - a. Respective manufacturer.
 - b. Estimated dates for installation completion.
 - c. Estimated training dates.
2. Allow for multiple sessions when several shifts are involved.
3. Adjust schedule to ensure training of appropriate personnel as deemed necessary by Owner, and to allow full participation by manufacturers' representatives. Adjust schedule for interruptions in operability of equipment.
4. Coordinate with Section 01 32 00, Construction Progress Documentation.

C. Lesson Plan: When manufacturer or vendor training of Owner personnel is specified, prepare a lesson plan for each required course containing the following minimum information:

1. Title and objectives.
2. Recommended attendees (such as, managers, engineers, operators, maintenance).
3. Course description, outline of course content, and estimated class duration.
4. Format (such as, lecture, self-study, demonstration, hands-on).
5. Instruction materials and equipment requirements.
6. Resumes of instructors providing training.

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- D. Training: Coordinate training sessions with Owner's operating personnel and manufacturers' representatives, and with submission of operation and maintenance manuals in accordance with Section 01 78 23, Operation and Maintenance Data.
- E. Recording of Training Sessions:
 - 1. Furnish audio and color recording of instruction sessions, including manufacturers' representatives' hands-on equipment instruction.
 - 2. Use Digital format suitable for playback on standard computer equipment available commercially in the United States.

3.04 SUPPLEMENT

- A. The supplement listed below, following "End of Section," is part of this specification:
 - 1. Manufacturer's Certificate of Proper Installation.

END OF SECTION

MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

OWNER _____ EQPT SERIAL NO: _____
EQPT TAG NO: _____ EQPT/SYSTEM: _____
PROJECT NO: _____ SPEC. SECTION: _____

I hereby certify that the above-referenced equipment/system has been:

(Check Applicable)

- Installed in accordance with Manufacturer's recommendations.
- Inspected, checked, and adjusted.
- Serviced with proper initial lubricants.
- Electrical and mechanical connections meet quality and safety standards.
- All applicable safety equipment has been properly installed.
- Functional tests.
- System has been performance tested, and meets or exceeds specified performance requirements. (When complete system of one manufacturer)

Note: Attach any performance test documentation from manufacturer.

Comments: _____

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate their equipment and (iii) authorized to make recommendations required to ensure equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date: _____, 20__

Manufacturer: _____

By Manufacturer's Authorized Representative: _____
(Authorized Signature)

SECTION 01 45 33
SPECIAL INSPECTION, OBSERVATION, AND TESTING

PART 1 GENERAL

1.01 SUMMARY

- A. This section covers requirements for Special Inspection, Observation, and Testing required in accordance with 2022 Oregon Structural Specialty Code (OSSC), Chapter 17 and 2021 IBC, Chapter 17.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Society of Civil Engineers (ASCE): 7, Minimum Design Loads for Buildings and Other Structures.
 2. International Code Council (ICC):
 - a. International Building Code (IBC).
 - b. Evaluation Service (ICC-ES) Reports and Legacy Reports.

1.03 DEFINITIONS

- A. Agencies and Personnel:
1. Agency Having Jurisdiction (AHJ): Permitting building agency; may be a federal, state, local, or other regional department, or individual including building official, fire chief, fire marshal, chief of a fire prevention bureau, labor department, or health department, electrical inspector; or others having statutory authority. AHJ may be Owner when authorized to be self-permitting by governmental permitting agency or when no governmental agency has authority.
 2. Approved Agency: An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved.
 3. Registered Design Professional in Responsible Charge: An individual who is registered or licensed to practice their respective design profession as defined by statutory requirements of professional registration laws of Oregon.
 4. Special Inspector: Qualified person employed by the Owner who will demonstrate competence to the satisfaction of AHJ for inspection of a particular type of construction or operation requiring Special Inspection.

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- B. Special Inspection:
 - 1. Special Inspection: Inspection required of materials, installation, fabrication, erection, or placement of components and connections requiring special expertise to ensure compliance with approved Contract Documents and referenced standards.
- C. Nonstructural Components:
 - 1. Architectural Component Supports: Structural members or assemblies of members which transmit loads and forces from architectural systems or components to structure, including braces, frames, struts, and attachments.
 - 2. Electrical Component Supports: Structural members or assemblies which transmit loads and forces from electrical equipment to concrete equipment pads, including braces, frames, legs, pedestals, and tethers, as well as elements forged or cast as part of component for anchorage.
 - 3. Mechanical and Plumbing Component Supports: Structural members or assemblies which transmit loads and forces from mechanical or plumbing equipment to structure, including braces, frames, skirts, legs, saddles, pedestals, snubbers, and tethers, as well as elements forged or cast as part of component for anchorage.

1.04 SUBMITTALS

- A. Informational Submittals:
 - 1. Contractor's Statement of Responsibility: Form shall be completed by entity responsible for construction. Refer to Article Supplements located at end of section.
 - 2. Fabricator's Certificate of Compliance: Form shall be completed by entity responsible for shop fabrication of structural load-bearing members and assemblies. Refer to Article Supplements located at end of section.
- B. Special Inspection will be performed by an approved accredited independent agency or by Authority Having Jurisdiction's (AHJ) approved, qualified inspection staff. Owner will secure and pay for services of agency to perform Special Inspection and associated testing.
- C. Code required Special Inspection with associated testing is for benefit of Owner and does not:
 - 1. Relieve Contractor of responsibility for providing adequate quality control measures.

2. Relieve Contractor of responsibility for damage to or loss of material before acceptance.
 3. Constitute or imply acceptance.
 4. Affect continuing rights of Owner after acceptance of completed Work.
- D. Contractor is responsible for additional costs associated with Special Inspection and Testing when Work is not ready at time identified by Contractor and Special Inspectors are onsite, but not able to provide contracted services.
- E. Contractor is responsible for associated costs for additional Special Inspection and Testing by Special Inspectors required because of rejection of materials of in place Work that cannot be made compliant to Contract Document without additional inspections and testing.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

- A. Special Inspections for this project include prepared subgrade density testing, placement of concrete reinforcing, concrete strength tests and post-installed concrete anchors, if approved for use.
- B. Notify Engineer in advance of required Special Inspection no later than 48 hours prior to date of Special Inspection.
- C. Provide access for Special Inspector to construction documents.
- D. Retain special inspection records on-site to be readily available for review.
- E. Cooperate with Special Inspector and provide safe access to the Work to be inspected.
- F. Submit Fabricator's Certificates of Compliance for approved fabricators.
- G. Provide reasonable auxiliary services as requested by the Special Inspector. Auxiliary services required include, but not limited to:
 1. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests to assist the Special Inspector in performing test/inspections.

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2. Providing storage space for the Special Inspector's exclusive use, such as for storing and curing concrete test samples and delivery of samples to testing laboratories.
 3. Providing the Special Inspector with access to all approved submittals.
 4. Providing security and protection of samples and test equipment at the Project Site.
 5. Provide samples of materials to be tested in required quantities.
- H. Inspections shall be made during placement and prior to placing concrete on prepared subgrade.

3.02 SUPPLEMENTS

- A. The supplements listed below, following "End of Section," are a part of this specification:
1. Contractor's Statement of Responsibility.
 2. Fabricator's Certificate of Compliance.
 3. Statement of Special Inspections.

END OF SECTION

CONTRACTOR'S STATEMENT OF RESPONSIBILITY

(Project)

(Name of Contracting Company)

(Business Address)

() _____ () _____
(Telephone) (Fax)

I, (We) hereby certify that I am (we are) aware of the Special Inspection and Testing requirements contained in Contract Documents for this Project, and that:

1. I, (We) aware of the systems and the requirements of the special inspection and acknowledge our responsibility in the implementation of the Special Inspections during construction.
2. Control of this Work will be exercised to obtain conformance with Contract Documents approved by building official.
3. I, (We) will provide 48-hour notification to Engineer and approved inspection agency as required for structural tests and Special Inspection for Project.
4. The following person is hereby identified as exercising control over requirements of this section for the Work designated above:

Name: _____

Qualifications: _____

(Print name and official title of person signing this form)

Signed by: _____

Date: _____

Project Name: _____

FABRICATOR’S CERTIFICATE OF COMPLIANCE

Each approved fabricator that is exempt from Special Inspection of shop fabrication and implementation procedures per Section 17 of IBC must submit Fabricator’s Certificate of Compliance at the completion of fabrication.

(Project)

(Fabricator’s Name)

(Business Address)

(Certification or Approval Agency)

(Certification Number)

(Date of Last Audit or Approval)

Description of structural members and assemblies that have been fabricated:

I hereby certify that items described above were fabricated in strict accordance with approved construction documents.

(Name and Title) type or print

(Signature and Date)

Attach copies of fabricator’s certification or building code evaluation service report and fabricator’s quality control manual.

STRUCTURAL OBSERVATION TABLE				
	SYSTEM	STAGE	ITEMS	COMMENTS
1.	FOUNDATION OR EQUIPMENT SLAB	PRIOR TO FIRST CONCRETE PLACEMENT OF FIRST SECTION WHEN ITEMS CAN STILL BE REVISED	REINFORCING STEEL, CONCRETE DOWELS, WATERSTOPS, EMBEDS, AND SIMILAR ITEMS	NOTE 1
2.	CONCRETE WALLS OF STRUCTURE	PRIOR TO FIRST CONCRETE PLACEMENT OF FIRST SECTION WHEN ITEMS CAN STILL BE REVISED	REINFORCING STEEL, WALL DOWELS, WATERSTOPS, EMBEDS, AND SIMILAR ITEMS	NOTE 1
3.	WALL TO FOUNDATION CONNECTIONS PRIOR TO FORM CLOSURE	PRIOR TO FIRST CONCRETE PLACEMENT OF FIRST SECTION WHEN ITEMS CAN STILL BE REVISED		NOTE 1
5.	CONCRETE STRUCTURES	PRIOR TO FIRST CONCRETE PLACEMENT ON FIRST LIQUID HOLDING STRUCTURE WHEN ITEMS CAN STILL BE REVISED	REINFORCING STEEL, WALL DOWELS, WATERSTOPS, EMBEDS, AND SIMILAR ITEMS	NOTE 1
8.	SYSTEM CONNECTION EMBEDS	PRIOR TO GROUT OR CONCRETE PLACEMENT		NOTE 1
9.	CONCRETE WALL TO FLOOR AND ROOF CONNECTIONS	PRIOR TO FORM CLOSURE OR OTHER COVER		NOTE 1
11.	STRUCTURAL STEEL FRAMING	DURING INITIAL CONSTRUCTION OF STEEL FRAMING AT FIRST STEEL FRAMED BUILDING PRIOR TO ENCLOSURE OF FRAMING BEHIND FINAL FINISHES	MEMBER LOCATIONS AND CONFIGURATIONS, BOLTED AND WELDED CONNECTIONS, AND SIMILAR ITEMS	NOTE 1

NOTES:

1. STRUCTURAL OBSERVER CAN ALSO BE THE OWNER OR THE OWNER'S SPECIAL INSPECTOR.

TABLE 1 REQUIRED GEOTECHNICAL SPECIAL INSPECTION REFER TO SPECIFICATION SECTION 01 45 33						
SYSTEM OR MATERIAL	2021 IBC CODE REFERENCE	REFERENCED STANDARD	PERIODIC OWNER FURNISHED SPECIAL INSPECTION (SEE NOTE 1)	CONTINUOUS OWNER FURNISHED SPECIAL INSPECTION	COMMENTS	TESTING FOR SPECIAL INSPECTION
GEOTECHNICAL						
1. SOILS:						
A. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY	1705.6, 1803.5.8, 1803.5.9, 1804.5	SECTION 31 23 13, SUBGRADE PREPARATION	X			
B. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL	1705.6	SECTION 31 23 16, EXCAVATION	X			
C. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS	1705.6	SECTION 31 23 23, FILL AND BACKFILL	X			SEE TABLE 3 FOR GRADATION TEST REQUIREMENTS
D. VERIFY USE OF PROPER MATERIALS, DENSITIES, AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL	1705.6, 1803.5.8	SECTION 31 23 23, FILL AND BACKFILL		X		SEE TABLE 3 FOR DENSITY TEST REQUIREMENTS
E. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY	1705.6	SECTION 31 23 13, SUBGRADE PREPARATION	X			SEE TABLE 3 FOR DENSITY TEST REQUIREMENTS

NOTES:

1. PERIODIC INSPECTION IS DEFINED AS INSPECTION BY THE SPECIAL INSPECTOR OF ALL MATERIALS AND SYSTEMS, IN SOME CASES PERFORMED DURING THEIR PLACEMENT AND IN ALL CASES PERFORMED UPON COMPLETION OF THEIR PLACEMENT. THE COMPLETION INSPECTION SHALL BE PERFORMED SO THAT WORK CAN BE CORRECTED PRIOR TO OTHER RELATED WORK PROCEEDING AND COVERING INSPECTED WORK.

TABLE 2 REQUIRED STRUCTURAL SPECIAL INSPECTION REFER TO SPECIFICATION SECTION 01 45 33						
SYSTEM	2021 IBC CODE REFERENCE	REFERENCED STANDARD	PERIODIC OWNER FURNISHED SPECIAL INSPECTION (SEE NOTE 1)	CONTINUOUS OWNER FURNISHED SPECIAL INSPECTION	COMMENTS	TESTING FOR SPECIAL INSPECTION
CONCRETE						
1. INSPECTION OF REINFORCING STEEL AND PLACEMENT	1705.3, 1903.1	ACI 318: 3.5, 7.1-7.7	X			
2. INSPECTION OF ANCHORS CAST IN CONCRETE	1705.3, 1908.5, 1909.1	ACI 318: 8.1.3	X			
4. INSPECTION OF ANCHORS POST- INSTALLED IN HARDENED CONCRETE MEMBERS	1705.3, 1909.1	ACI 318: 3.8.6, 8.1.3, ICC-ES EVALUATION REPORTS	X		PROVIDE CONTINUOUS SPECIAL INSPECTION WHERE REQUIRED BY ICC-ES REPORT	
5. VERIFYING USE OF REQUIRED DESIGN MIX	1705.3	ACI 318: Ch. 4, 5.2-5.4	X			

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SYSTEM	2021 IBC CODE REFERENCE	REFERENCED STANDARD	PERIODIC OWNER FURNISHED SPECIAL INSPECTION (SEE NOTE 1)	CONTINUOUS OWNER FURNISHED SPECIAL INSPECTION	COMMENTS	TESTING FOR SPECIAL INSPECTION
6. AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE	1705.3	ASTM C 172, ASTM C 31, ACI 318: 5.6, 5.8		X		SEE TABLE 3 FOR CONCRETE TEST REQUIREMENTS
8. INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES	1705.3	ACI 318: 5.11-5.13	X			
12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED	1705.3	ACI 318: 6.1.1	X			

NOTES:

1. PERIODIC INSPECTION IS DEFINED AS INSPECTION BY THE SPECIAL INSPECTOR OF ALL MATERIALS AND SYSTEMS, IN SOME CASES PERFORMED DURING THEIR PLACEMENT AND IN ALL CASES PERFORMED UPON COMPLETION OF THEIR PLACEMENT. THE COMPLETION INSPECTION SHALL BE PERFORMED SO THAT WORK CAN BE CORRECTED PRIOR TO OTHER RELATED WORK PROCEEDING AND COVERING INSPECTED WORK.

TABLE 3 TESTING FOR REQUIRED SPECIAL INSPECTION REFER TO SPECIFICATION SECTION 01 45 33						
MATERIAL	TYPE OR SCOPE	STANDARD	2021 IBC CODE REFERENCE	FREQUENCY	BY WHOM	COMMENTS
GEOTECHNICAL						
COMPACTED FILL	GRADATION	ASTM C117, C136	1705.6	SECTION 31 23 23, FILL AND BACKFILL	OWNER'S TESTING AGENCY	
COMPACTED FILL	COMPACTION	ASTM D1557	1705.6	SECTION 31 23 23, FILL AND BACKFILL	OWNER'S TESTING AGENCY	
COMPACTED FILL	DENSITY	ASTM D6938	1705.6	SECTION 31 23 23, FILL AND BACKFILL	OWNER'S TESTING AGENCY	
PREPARED SUBGRADE	DENSITY	ASTM D1557	1705.6	SECTION 31 23 13, SUBGRADE PREPARATION	OWNER'S TESTING AGENCY	
CONCRETE						
CONCRETE	STRENGTH	ASTM C39	1705.3	ONCE EACH DAY, BUT NOT LESS THAN ONE SAMPLE FOR EACH CONCRETE TRUCK	OWNER'S TESTING AGENCY	
CONCRETE	SLUMP	ASTM C143, C94	1705.3	ONE SAMPLE PER STRENGTH TEST	OWNER'S TESTING AGENCY	
CONCRETE	AIR CONTENT	ASTM C231, C94	1705.3	ONE SAMPLE PER STRENGTH TEST	OWNER'S TESTING AGENCY	
CONCRETE	TEMPERATURE	ASTM C1064	1705.3	ONE SAMPLE PER STRENGTH TEST	OWNER'S TESTING AGENCY	

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Association of Nurserymen (AAN): American Standards for Nursery Stock.
 2. Federal Emergency Management Agency (FEMA).
 3. National Fire Prevention Association (NFPA): 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.
 4. Telecommunications Industry Association (TIA); Electronic Industries Alliance (EIA): 568B, Commercial Building Telecommunications Cabling Standard.
 5. U.S. Department of Agriculture (USDA): Urban Hydrology for Small Watersheds.
 6. U.S. Weather Bureau: Rainfall-Frequency Atlas of the U.S. for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years.

1.02 SUBMITTALS

- A. Informational Submittals:
1. Copies of permits and approvals for construction as required by Laws and Regulations and governing agencies.
 2. Temporary Construction Submittals:
 - a. Access Roads: Routes.
 - b. Contractor's field office, storage yard, and storage building plans, including gravel surfaced area.
 - c. Staging area location plan.
 3. Temporary Control Submittals:
 - a. Dust control plan.
 - b. Plan for disposal of waste materials and intended haul routes.

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1.03 MOBILIZATION

- A. Mobilization includes, but is not limited to, these principal items:
 - 1. Obtaining required permits.
 - 2. Moving Contractor's field office and equipment required for first month operations onto Site.
 - 3. Installing temporary construction power, wiring, and lighting facilities.
 - 4. Providing onsite Internet service.
 - 5. Providing onsite sanitary facilities and potable water facilities as specified and as required by Laws and Regulations, and governing agencies.
 - 6. Arranging for and erection of Contractor's work and storage yard.
 - 7. Posting OSHA required notices and establishing safety programs and procedures.
 - 8. Having Contractor's superintendent at Site full time.
 - 9. Providing Engineer's facilities.
- B. Use area designated for Contractor's temporary facilities as shown on Drawings.
- C. No more than half of Schedule of Values mobilization line item will be approved prior to installation of Engineer's Field Office.

1.04 PROTECTION OF WORK AND PROPERTY

- A. Comply with Owner's safety rules while on Owner's property.
- B. Keep Owner informed of serious onsite accidents and related claims.
- C. Use of Explosives: No blasting or use of explosives will be allowed onsite.

1.05 VEHICULAR TRAFFIC

- A. Traffic Control Plan:
 - 1. Adhere to traffic control plan reviewed and accepted by Engineer. Changes to this plan shall be made only by written approval of Engineer. Secure approvals for necessary changes so as not to delay progress of the Work.
 - 2. Maintain traffic lanes wide enough or located to include an allowable travel path for semitrailer trucks to turn onto cross streets.

- B. Traffic Routing Plan: Show sequences of construction affecting use of roadways, time required for each phase of the Work, provisions for decking over excavations and phasing of operations to provide necessary access, and plans for signing, barricading, and striping to provide passages for pedestrians and vehicles.

PART 2 PRODUCTS

2.01 ENGINEER'S FIELD OFFICES

- A. Furnish equipment specified for exclusive use of Engineer and its' representatives.
- B. Ownership of equipment furnished under this article will remain, unless otherwise specified, that of Contractor.
- C. Equipment furnished shall be new or like new in appearance and function.
- D. Minimum Features:
 - 1. 110-volt lighting and wall plugs.
 - 2. Fluorescent ceiling lights.
 - 3. Electric heating and self-contained air conditioning unit, properly sized for Project locale and conditions. Provide ample electric power to operate installed systems.
 - 4. Covered entrances with railed stairways, and landings, and exterior lighting at entrances.
 - 5. Sign on entrance door reading JACOBS, letter height 4 inches minimum.
 - 6. Exterior Door(s):
 - a. Number: One.
 - b. Type: Solid core.
 - c. Lock(s): Cylindrical.
 - 7. Number of Windows: Two.
 - 8. Minimum Interior Height: 8 feet.
- E. Floor Space: Minimum 150 square feet.
- F. Plan table; plan rack; double desk with desk surface located 29 inches from floor; two 2-drawer, steel file cabinets; and overhead shelf.
- G. If Engineer's office is to be located in same structure as superintendent's office, partition off area for Engineer's use and provide a separate, lockable entrance.

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H. Office Equipment—General:

1. Bottled Water Service: One, with cooler capable of producing hot water and cold water.
2. Paper Cup Dispenser with Cups: One.
3. Paper Towel Dispenser with Towels: One.
4. Desk Chair:
 - a. One, with the following characteristics:
 - 1) Five castor base.
 - 2) Adjustable height.
 - 3) Swivels.
 - 4) Locking Back.
 - 5) Adjustable seat back for height and angle.
 - 6) Adjustable arms.
5. Steel Folding Chairs: Two.
6. Wastepaper Basket: One.
7. Blue Recycling Basket: One.
8. Clothes Rack: One.
9. First-Aid Kit: One.
10. Tri-Class (ABC), Dry Chemical Fire Extinguisher, 10-Pound: One.
11. Power Supply Surge Protector: One each per computer; rated at 15 amps minimum.
12. Printer: One each; HP Laser Printer capable of 11 inch by 17 inch printing.
13. Printer Accessories: Black and color toner cartridges.
14. Maintenance service agreements for all hardware for duration of Contract.

2.02 PROJECT SIGN

- A. Provide and maintain one, up to 8-foot-wide by 4-foot-high backing structure for mounting the Project sign constructed of 3/4-inch exterior high density overlaid plywood and mounted a minimum of 4 feet above the ground. Sign will be provided by the Owner, coordinate structure with final size size.

PART 3 EXECUTION

3.01 ENGINEER'S FIELD OFFICE

- A. Make available for Engineer's use prior to start of the Work at Site and to remain on Site for minimum of 30 days after final acceptance of the Work.
- B. Locate in area shown on Drawings; level, block, tie down, skirt, provide stairways, and relocate when necessary and approved. Construct on proper

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foundations, and provide proper surface drainage and connections for utility services.

- C. Provide minimum 100 square feet of gravel or crushed rock base, minimum depth of 4 inches, at each entrance.
- D. Raise grade under field office, as necessary, to elevation adequate to avoid flooding.
- E. Provide sanitary facilities in compliance with state and local health authorities.
- F. Exterior Door Keys: Furnish three set(s) of keys.
- G. Maintain in good repair and appearance, and provide weekly cleaning service and replenishment, as required, of paper towels, paper cups, hand soap, toilet paper, first-aid kit supplies, and bottled water.
- H. Replenish, as needed, copy paper and toner.

3.02 TEMPORARY UTILITIES

- A. Power:
 - 1. Electric power will be available near Site. Determine type and amount available and make arrangements for obtaining temporary electric power service, metering equipment, and pay costs for electric power used during Contract period, except for portions of the Work designated in writing by Engineer as substantially complete.
 - 2. Cost of electric power will be borne by Contractor.
- B. Lighting: Provide temporary lighting to meet applicable safety requirements to allow erection, application, or installation of materials and equipment, and observation or inspection of the Work.
- C. Heating, Cooling, and Ventilating:
 - 1. Provide as required to maintain adequate environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for installation of materials, and to protect materials, equipment, and finishes from damage because of temperature or humidity. Costs for temporary heat shall be borne by Contractor responsible for constructing structure or building as specified in Section 01 11 00, Summary of Work.

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2. Provide adequate forced air ventilation of enclosed areas to cure installed materials, to dispense humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases.
3. Pay costs of installation, maintenance, operation, removal, and fuel consumed.
4. Provide portable unit heaters, complete with controls, oil- or gas-fired, and suitably vented to outside as required for protection of health and property.
5. If permanent natural gas piping is used for temporary heating units, do not modify or reroute gas piping without approval of utility company. Provide separate gas metering as required by utility.

D. Water:

1. No construction or potable water is available at Site. Make arrangements for and bear costs of providing water required for construction purposes and for drinking by construction personnel during construction.
2. Hydrant Water:
 - a. Is available from nearby hydrants. Secure written permission for connection and use from water department and meet requirements for use. Notify fire department before obtaining water from fire hydrants.
 - b. Use only special hydrant-operating wrenches to open hydrants. Make certain hydrant valve is open full, since cracking valve causes damage to hydrant. Repair damaged hydrants and notify appropriate agency as quickly as possible. Hydrants shall be completely accessible to fire department at all times.
 - c. Include costs to connect and transport water to construction areas in Contract Price.
3. Provide and bear costs of necessary water required for testing equipment, tanks or basins, and piping prior to Substantial Completion, unless otherwise specifically stated in Specifications for equipment, systems, or facilities to be tested.
4. Provide means to prevent water used for testing from flowing back into source pipeline.

E. Sanitary and Personnel Facilities: Provide and maintain facilities for Contractor's employees, Subcontractors, and other onsite employers' employees. Service, clean, and maintain facilities and enclosures.

F. Fire Protection: Furnish and maintain on Site adequate firefighting equipment capable of extinguishing incipient fires. Comply with applicable parts of NFPA 241.

3.03 PROTECTION OF WORK AND PROPERTY

A. General:

1. Perform Work within right-of-way and easements in a systematic manner that minimizes inconvenience to property owners and the public.
2. No residence or business shall be cut off from vehicular traffic for a period exceeding 4 hours, unless special arrangements have been made.
3. Maintain in continuous service existing oil and gas pipelines, underground power, telephone or communication cable, water mains, irrigation lines, sewers, poles and overhead power, and other utilities encountered along line of the Work, unless other arrangements satisfactory to owners of said utilities have been made.
4. Where completion of the Work requires temporary or permanent removal or relocation of existing utility, coordinate activities with owner of said utility and perform work to their satisfaction.
5. Protect, shore, brace, support, and maintain underground pipes, conduits, drains, and other underground utility construction uncovered or otherwise affected by construction operations.
6. Keep fire hydrants and water control valves free from obstruction and available for use at all times.
7. In areas where Contractor's operations are adjacent to or near a utility, such as gas, telephone, television, electric power, water, sewer, or irrigation system, and such operations may cause damage or inconvenience, suspend operations until arrangements necessary for protection have been made by Contractor.
8. Notify property owners and utility offices that may be affected by construction operation at least 2 days in advance: Before exposing a utility, obtain utility owner's permission. Should service of utility be interrupted due to Contractor's operation, notify proper authority immediately. Cooperate with said authority in restoring service as promptly as possible and bear costs incurred.
9. Do not impair operation of existing sewer system. Prevent construction material, pavement, concrete, earth, volatile and corrosive wastes, and other debris from entering sewers, pump stations, or other sewer structures.
10. Maintain original Site drainage wherever possible.

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- B. Barricades and Lights:
1. Provide as required by the Oregon Vehicle Code and in sufficient quantity to safeguard public and the Work.
 2. Provide as necessary to prevent unauthorized entry to construction areas and affected roads, streets, and alleyways, inside and outside of fenced area, and as required to ensure public safety and the safety of Contractor's employees, other employer's employees, and others who may be affected by the Work.
 3. Provide to protect existing facilities and adjacent properties from potential damage.
 4. Locate to enable access by facility operators and property owners.
 5. Protect streets, roads, highways, and other public thoroughfares that are closed to traffic by effective barricades with acceptable warning signs.
 6. Locate barricades at the nearest intersecting public thoroughfare on each side of blocked section.
 7. Illuminate barricades and obstructions with warning lights from sunset to sunrise.
- C. Signs and Equipment: Conform to requirements of manual published by the State Department of Transportation.
- D. Trees and Plantings:
1. Protect from damage and preserve trees, shrubs, and other plants outside limits of the Work and within limits of the Work, which are designated on Drawings to remain undisturbed.
 - a. Where practical, tunnel beneath trees when on or near line of trench.
 - b. Employ hand excavation as necessary to prevent tree injury.
 - c. Do not stockpile materials or permit traffic within drip lines of trees.
 - d. Provide and maintain temporary barricades around trees.
 - e. Water vegetation as necessary to maintain health.
 - f. Cover temporarily exposed roots with wet burlap, and keep burlap moist until soil is replaced around roots.
 - g. No trees, except those specifically shown on Drawings to be removed, shall be removed without written approval of Engineer.
 - h. Dispose of removed trees in a legal manner off the Site.
 2. Balling and burlapping of trees indicated for replacement shall conform to recommended specifications set forth in the American Standards for Nursery Stock, published by American Association of Nurserymen. Balls shall be firm and intact and made-balls will not be accepted. Handle ball and burlap trees by ball and not by top.

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3. In event of damage to bark, trunks, limbs, or roots of plants that are not designated for removal, treat damage by corrective pruning, bark tracing, application of a heavy coating of tree paint, and other accepted horticultural and tree surgery practices.
 4. Replace each plant that dies as a result of construction activities.
- E. Existing Structures:
1. Where Contractor contemplates removal of small structures such as mailboxes, signposts, and culverts that interfere with Contractor's operations, obtain approval of property owner and Engineer.
 2. Move mailboxes to temporary locations accessible to postal service.
 3. Replace items removed in their original location and a condition equal to or better than original.
- F. Finished Construction: Protect finished floors and concrete floors exposed as well as those covered with composition tile or other applied surfacing.
- G. Waterways: Keep ditches, culverts, and natural drainages continuously free of construction materials and debris.
- H. Dewatering: Construct, maintain, and operate cofferdams, channels, flume drains, sumps, pumps, or other temporary diversion and protection works. Furnish materials required, install, maintain, and operate necessary pumping and other equipment for the environmentally safe removal and disposal of water from the various parts of the Work. Maintain foundations and parts of the Work free from water.
- I. Archaeological Finds:
1. General: Should finds of an archaeological or paleontological nature be made within Site limits, immediately notify Owner and Engineer and proceed in accordance with General Conditions. Continue the Work in other areas without interruption.
 2. Archaeological Finds: Evidence of human occupation or use of an area within contract limits prior to the Year 1840. Evidence may consist of skeletons, stone, or other utensils, or evidence of habitations or structures.
 3. Paleontological Finds: Evidence of prehistoric plant or animal life, such as skeletons, bones, fossils, or casts and other indications such as pictographs.
 4. Owner may order the Work stopped in other areas if, in Owner's opinion, find is more extensive than may appear from uncovered material.

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5. Protection of Finds:
 - a. Cover, fence, or otherwise protect finds until notice to resume the Work is given.
 - b. Cover finds with plastic film held in place by earth, rocks, or other weights placed outside the find. Should additional backfilling be necessary for safety or to prevent caving, place backfill material loosely over plastic film.
 - c. Sheet or shore as necessary to protect excavations underway. Place temporary fence to prevent unauthorized access.
 - d. Dewater finds made below water table as necessary to protect construction Work underway. Divert groundwater or surface runoff away from find by ditching or other acceptable means.
6. Removal of Finds:
 - a. Finds are property of Owner. Do not remove or disturb finds without Owner's written authorization.
 - b. Should Owner elect to have a find removed, provide equipment, labor, and material to permit safe removal of find without damage. Provide transportation for delivery to individuals, institutions, or other places as Owner may find desirable, expedient, or required by law.

J. Endangered and Threatened Species:

1. Take precautions necessary and prudent to protect native endangered and threatened flora and fauna.
2. Notify Engineer of construction activities that might threaten endangered and threatened species or their habitats.
3. Engineer will mark areas known as habitats of endangered and threatened species prior to commencement of onsite activities.
4. Additional areas will be marked by Engineer as other habitats of endangered and threatened species become known during construction.

3.04 TEMPORARY CONTROLS

A. Air Pollution Control:

1. Minimize air pollution from construction operations.
2. Burning of waste materials, rubbish, or other debris will not be permitted on or adjacent to Site.
3. Conduct operations of dumping rock and of carrying rock away in trucks to cause a minimum of dust. Give unpaved streets, roads, detours, or haul roads used in construction area a dust-preventive treatment or

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periodically water to prevent dust. Strictly adhere to applicable environmental regulations for dust prevention.

4. Provide and maintain temporary dust-tight partitions, bulkheads, or other protective devices during construction to permit normal operation of existing facilities. Construct partitions of plywood, insulating board, plastic sheets, or similar material. Construct partitions in such a manner that dust and dirt from demolition and cutting will not enter other parts of existing building or facilities. Remove temporary partitions as soon as need no longer exists.
- B. Noise Control: Provide acoustical barriers so noise emanating from tools or equipment will not exceed legal noise levels.
- C. Water Pollution Control:
1. Prior to commencing excavation and construction, obtain Engineer's agreement with detailed plans showing procedures intended to handle and dispose of sewage, groundwater, and dewatering pump discharges.
 2. Comply with Section 01 57 13, Temporary Erosion and Sedimentation Control, for stormwater flow and surface runoff.
 3. Do not dispose of volatile wastes such as mineral spirits, oil, chemicals, or paint thinner in storm or sanitary drains. Disposal of wastes into streams or waterways is prohibited. Provide acceptable containers for collection and disposal of waste materials, debris, and rubbish.
- D. Erosion, Sediment, and Flood Control: Provide, maintain, and operate temporary facilities as specified in Section 01 57 13, Temporary Erosion and Sedimentation Control, to control erosion and sediment releases, and to protect the Work and existing facilities from flooding during construction period.

3.05 STORAGE YARDS AND BUILDINGS

- A. Temporary Storage Yards: Construct temporary storage yards for storage of products that are not subject to damage by weather conditions.
- B. Temporary Storage Buildings:
1. Provide environmental control systems that meet recommendations of manufacturers of equipment and materials stored.
 2. Arrange or partition to provide security of contents and ready access for inspection and inventory.
 3. Store combustible materials (paints, solvents, fuels) in a well-ventilated and remote building meeting safety standards.

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3.06 ACCESS ROADS AND DETOURS

- A. Construct access roads as shown and within easements, rights-of-way, or Project limits. Alignments for new routes shall be approved by Engineer.
- B. Maintain drainage ways. Install and maintain culverts to allow water to flow beneath access roads. Provide corrosion-resistant culvert pipe of adequate strength to resist construction loads.
- C. Provide gravel, crushed rock, or other stabilization material to permit access by all motor vehicles at all times.
- D. Maintain road grade and crown to eliminate potholes, rutting, and other irregularities that restrict access.
- E. Coordinate with Engineer detours and other operations affecting traffic and access. Provide at least 72 hours' notice to Engineer of operations that will alter access to Site.
- F. Upon completion of construction, restore ground surface disturbed by access road construction to original grade. Replace damaged or broken culverts with new culvert pipe of same diameter and material.

3.07 PARKING AREAS

- A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations.
- B. Provide parking facilities for personnel working on Project. No employee or equipment parking will be permitted on Owner's existing paved areas.
- C. Use area designated on Drawings for parking of Contractor's and Contractor's employees' vehicles.

3.08 VEHICULAR TRAFFIC

- A. Comply with Laws and Regulations regarding closing or restricting use of public streets or highways. No public or private road shall be closed, except by written permission of proper authority. Ensure the least possible obstruction to traffic and normal commercial pursuits.
- B. Conduct the Work to interfere as little as possible with public travel, whether vehicular or pedestrian.

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- C. Whenever it is necessary to cross, close, or obstruct roads, driveways, and walks, whether public or private, provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel.
- D. Road Closures: Maintain satisfactory means of exit for persons residing or having occasion to transact business along route of the Work. If it is necessary to close off roadway or alley providing sole vehicular access to property for periods greater than 2 hours, provide written notice to each owner so affected 3 days prior to such closure. In such cases, closings of up to 4 hours may be allowed. Closures of up to 10 hours may be allowed if a week's written notice is given and undue hardship does not result.
- E. Maintenance of traffic is not required if Contractor obtains written permission from Owner and tenant of private property, or from authority having jurisdiction over public property involved, to obstruct traffic at designated point.
- F. In making street crossings, do not block more than one-half the street at a time. Whenever possible, widen shoulder on opposite side to facilitate traffic flow. Provide temporary surfacing on shoulders as necessary.
- G. Maintain top of backfilled trenches before they are paved, to allow normal vehicular traffic to pass over. Provide temporary access driveways where required. Cleanup operations shall follow immediately behind backfilling.
- H. When flaggers and guards are required by regulation or when deemed necessary for safety, furnish them with approved orange wearing apparel and other regulation traffic control devices.
- I. Notify fire department and police department before closing street or portion thereof. Notify said departments when streets are again passable for emergency vehicles. Do not block off emergency vehicle access to consecutive arterial crossings or dead-end streets, in excess of 300 linear feet, without written permission from fire department. Conduct operations with the least interference to fire equipment access, and at no time prevent such access. Furnish Contractor's night emergency telephone numbers to police department.

3.09 CLEANING DURING CONSTRUCTION

- A. In accordance with General Conditions, as may be specified in other Specification sections, and as required herein.

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- B. Wet down exterior surfaces prior to sweeping to prevent blowing of dust and debris. At least weekly, sweep floors (basins, tunnels, platforms, walkways, roof surfaces), and pick up and dispose of debris.
- C. Provide approved containers for collection and disposal of waste materials, debris, and rubbish. At least weekly, dispose of such waste materials, debris, and rubbish offsite.
- D. At least weekly, brush sweep entry drive, roadways, and other streets and walkways affected by the Work and where adjacent to the Work.

3.10 PROJECT SIGN

- A. Project sign shall be posted on the project site for the duration of construction.
- B. Project sign shall be posted in an area that is visible to the public.
 - 1. Sign location to be determined during the Pre-Construction Meeting.

END OF SECTION

SECTION 01 57 13
TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SUMMARY

- A. This section covers Work to implement structural and nonstructural Best Management Practices (BMP) to control soil erosion by wind or water and keep eroded sediments and other construction-generated pollutants from moving off project sites. Requirements described in this specification and shown on the Drawings are part of the project Temporary Erosion and Sediment Control Plan (TESC Plan) and are the minimum for all project construction sites and conditions. This specification covers all project activities, including material sources, disposal sites, and offsite mitigation areas unless specific project activities are excluded elsewhere in this specification or in other Contract Documents controlling the Work.
- B. National Pollutant Discharge Elimination System: Comply with Federal, state, and local laws, rules and regulations, and the National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Discharge Permit or Permits applicable to the project. A copy of the Project's General Construction Permit, if applicable to the Project, is available from Owner. NPDES General Construction permits are required on projects that involve disturbance of 1 acre or more with potential to discharge stormwater to surface waters.
- C. Other Regulations: A local government erosion and sediment control permit may apply and some local agency requirements may be more stringent than this specification. Adequate erosion and sediment control is essential for complying with the federal Endangered Species Act where construction runoff enters waters inhabited by protected species.

1.02 REFERENCES

- A. Activities shall conform to the Oregon DEQ Construction Stormwater Erosion and Sediment Control Manual, the Standard Specifications, the Project 1200-C NPDES General Permit, and Drawings. In the event of a conflict, the more stringent requirement shall apply.

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- B. The following is a list of standards that may be referenced in this section:
1. American Association of State Highway and Transportation Officials (AASHTO): M252, Standard Specification for Corrugated Polyethylene Drainage Pipe.
 2. ASTM International (ASTM):
 - a. D638, Standard Test Method for Tensile Properties of Plastics.
 - b. D2974, Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.
 - c. D3776/D3776M, Standard Test Methods for Mass Per Unit Area (Weight) of Fabric.
 - d. D4355, Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus.
 - e. D4397, Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
 - f. D4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - g. D4533, Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
 - h. D4632/D4632M, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
 - i. D4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile
 - j. D6241, Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.
 - k. D6459, Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Hillslopes from Rainfall-Induced Erosion.
 - l. D6460, Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Earthen Channels from Stormwater-Induced Erosion.
 - m. D6475, Standard Test Method for Measuring Mass Per Unit Area of Erosion Control Blankets.
 - n. D7322, Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Ability to Encourage Seed Germination and Plant Growth Under Bench-Scale Conditions.
 - o. D7367, Standard Test Method for Determining Water Holding Capacity of Fiber Mulches for Hydraulic Planting.
 3. National Weather Service:
 - a. Precipitation-Frequency of the United States by State/Territory, 2012.
 - b. Precipitation Frequency Data Server, 2012.

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4. North American Weed Management Association (NAWMA).
5. U.S. Department of Agriculture, Natural Resources Conservation Service: *Urban Hydrology for Small Watersheds*; 1986. Technical Release 55.
6. U.S. Environmental Protection Agency:
 - a. Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites, 2007. EPA-833-R-06-004.
 - b. National Menu of BMPs, 2012.

1.03 SYSTEM DESCRIPTION

A. Erosion and Sediment Control:

1. Provide, maintain, and operate temporary facilities to control erosion and sediment releases during construction period.
2. Design erosion and sediment controls to handle peak runoff resulting from 25-year, 24-hour storm event based on National Weather Service: Precipitation Frequency Data Server.
3. Size temporary stormwater conveyances based on procedures presented in U.S. Department of Agriculture, Natural Resources Conservation Service: *Urban Hydrology for Small Watersheds*, 1986. Technical Release 55.

B. Erosion and Sediment Control (ESC) Lead:

1. Identify the ESC Lead at the preconstruction discussions and in the TESC Plan. The ESC Lead shall have certification in construction site erosion and sediment control from a course approved by Owner.
2. The ESC Lead shall implement the TESC Plan, including, but not limited to:
 - a. Installing and maintaining all temporary erosion and sediment control Best Management Practices (BMPs) included in the TESC Plan to assure continued performance of their intended function. Damaged or inadequate TESC BMPs shall be corrected immediately.
 - b. Updating TESC Plan to reflect current field conditions.
 - c. Terminating TESC Plan when construction and final stabilization is complete.
3. When a TESC Plan is included in the Contract Plans, ESC Lead shall also inspect all areas disturbed by construction activities, all onsite erosion and sediment control BMPs, all stormwater discharge points, and all temporarily stabilized inactive sites per schedule in the Construction Stormwater Discharge Permit(s) or as directed by Engineer. Complete erosion and sediment control inspection form

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provided by water resource agency or Owner for each inspection and submit a copy to Engineer no later than end of the next working day following inspection.

C. Personnel Training:

1. Prior to commencement of construction, applicable personnel must have an understanding of the Construction Stormwater Discharge Permit's requirements and their specific responsibilities under the permit. At a minimum, personnel must be trained to understand the following as it relates to the scope of their job duties:
 - a. The location of all stormwater controls and how to maintain them.
 - b. Procedures for complying with the pollution prevention requirements.
 - c. Procedures for conducting inspections, recording findings, and taking corrective action.

D. Temporary Erosion and Sediment Control Plan (Stormwater Pollution Prevention Plan):

1. TESC Drawings are furnished as part of the Drawings, which helps fulfill part of the plan requirement of the 1200-C Permit. This initial TESC Plan, when adopted by Contractor, may be used as the basis of the construction TESC Plan. Additional or revised erosion and sediment control features, not shown on the initial TESC Plan, may be required depending on Contractor's methods of operation and schedule.
2. For each phase of the scheduled work, indicate on the TESC Plan all the BMPs proposed and installed for erosion and sediment control to minimize clearing, stabilize exposed soil, divert or temporarily store flows, limit runoff from exposed areas, and filter transported sediment. Include all temporary slopes, constructed for staging or other reasons, which may not have been identified in the original Contract plans. Refer to the current local jurisdiction's erosion and sediment control manual.
3. Include the following BMPs for all construction waste:
 - a. Procedures based on best management practices to confine, remove, and dispose of construction waste, including every type of debris, discharge water, concrete, cement, grout, washout facility, welding slag, petroleum product, or other hazardous materials generated, used, or stored on-site.
 - b. Temporarily store any waste liquids generated at the staging areas under cover on an impervious surface, such as tarpaulins, until such time they can be properly transported to and treated at an approved facility for treatment of hazardous materials.

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4. Some TESC Plan required elements typically required by NPDES permits:
- a. Narrative Site Description:
 - 1) Nature of construction activity planned for the Site.
 - 2) Estimates of total site area and the areas of the Site expected to be disturbed.
 - 3) Soil types found onsite and their erosion potential.
 - 4) The types of fill materials to be used.
 - 5) Timetable for sequence of major construction events.
 - b. Site Map:
 - 1) All areas of development.
 - 2) Drainage patterns.
 - 3) Areas of soil disturbance, including pre-development and post-development elevation contours.
 - 4) Areas used for storage of soils or wastes.
 - 5) Areas where vegetative practices are to be implemented.
 - 6) Location of all erosion and sediment control BMP or structures.
 - 7) Location of all impervious structures and surfaces after project is completed.
 - 8) Springs, wetlands, and other surface waters located onsite.
 - 9) Boundaries of the 100-year floodplain, if determined.
 - 10) Ordinary high-water line, if determined.
 - 11) Location of storm drainage outfalls to receiving waters, if applicable.
 - 12) Details of sediment and erosion controls.
 - 13) Details of detention ponds, storm drain piping, inflow and outflow details.
 - c. Required BMPs and Procedures for Erosion Prevention, Runoff Control, and Sediment Control:
 - 1) Construction entrances and parking areas.
 - 2) Unpaved site roads such as haul roads.
 - 3) Hauling saturated soils from the Site.
 - 4) Water washed from concrete trucks.
 - 5) Correct installation of erosion and sediment control BMPs.
 - 6) Prompt maintenance and repair of BMPs.
 - 7) Clearing and grading practices to minimize area of exposed soil throughout life of the Project.
 - 8) Schedule of phased clearing operations to limit soils to what can be stabilized.
 - 9) Vegetative practices, including preservation of existing vegetation, seeding, mulching, and buffer strips.
 - 10) Preventing erosion of exposed areas.
 - 11) Diverting flows from exposed slopes.

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- 12) Limiting runoff from exposed areas.
 - 13) Limiting sediment transport within work sites and keeping it from moving off of project areas.
 - 14) Perimeter controls for all clearing and grubbing, both planned and installed.
 - 15) Additional controls for wet season work and temporary work suspensions.
 - 16) Sensitive areas such as wetlands.
 - 17) Offsite material source and waste areas.
 - 18) Dust.
 - 19) Emergency materials stockpiled onsite.
 - 20) Storing flows and filtering sediment.
 - 21) Soil stockpiles.
5. Contractor's construction TESC Plan and implementation schedules must be prepared by a competent individual. Furnish a signed copy of the TESC Plan with individual's name, title, state certifications, and employing firm if different than Contractor's firm.
 6. Do not begin any Site activities that have potential to cause erosion or sediment movement until the TESC Plan and implementation schedules are approved by Engineer.
 7. Keep a copy of the approved TESC Plan with updated changes onsite during all construction activities. During inactive periods longer than 7 calendar days, keep the TESC Plan onsite or provide a copy to Engineer to retain.
 8. Continually update the TESC Plan and schedules as needed for unexpected storm or other events to ensure that sediment-laden water does not leave the construction site. Add approved changes to the TESC Plan no later than 24 hours after implementation.
- E. Install clearing limit fence outside the earthwork limits for the project and along the Site preservation lines shown on Drawings or as instructed by Engineer. Space posts and attach fence fabric to posts as shown on the Drawings. Do not fasten fence to trees. Throughout the life of the Project, preserve and protect the delineated area, acting immediately to repair or restore any fencing damaged or removed.
- F. Preventing erosion, and controlling runoff, sedimentation, and non-stormwater pollution, requires Contractor to perform temporary Work items including, but not limited to:
1. Providing ditches, berms, culverts, and other measures to control surface water.
 2. Building dams, settling basins, energy dissipaters, and other measures, to control downstream flows.

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3. Controlling underground water found during construction.
 4. Covering or otherwise protecting slopes until permanent erosion control measures are working.
- G. To the degree possible, coordinate this temporary Work with permanent drainage and erosion control work the Contract requires.
- H. Engineer may require additional temporary control measures if it appears pollution or erosion may result from weather, nature of materials, or progress on the Work.
- I. When natural elements rut or erode the slope, restore and repair damage with eroded material where possible, and remove and dispose of any remaining material found in ditches and culverts.
- J. Install all sediment control devices including, but not limited to, sediment ponds, perimeter silt fencing, or other sediment trapping BMPs prior to any ground disturbing activity. Do not expose more erodible earth than necessary during clearing, grubbing, excavation, borrow, or fill activities without written approval by Engineer. Engineer may increase or decrease the limits based on project conditions. Erodible earth is defined as any surface where soils, grindings, or other materials may be capable of being displaced and transported by rain, wind, or surface water runoff. Cover inactive areas of erodible earth, whether at final grade or not, within specified time period (see 1200-C NPDES Erosion and Sediment Control Permit), using an approved soil covering practice. Phase clearing and grading to maximum extent practical to prevent exposed inactive areas from becoming a source of erosion.
- K. Water Management:
1. Manage site water in accordance with the conditions of the waste discharge permit from a local permitting authority. If site water management is not subject to permit, manage as follows:
 - a. Groundwater. When groundwater is encountered in an excavation, treat and discharge as follows:
 - 1) When groundwater conforms to State of Oregon Water Quality Standards, it may bypass detention and treatment facilities and be routed directly to its normal discharge point at a rate and method that will not cause erosion.
 - 2) When turbidity of groundwater is similar to turbidity of site runoff, groundwater may be treated using same detention and treatment facilities being used to treat the site runoff and then discharged at a rate that will not cause erosion.

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- 3) When groundwater turbidity is greater than turbidity of site runoff, treat ground water separately until turbidity is similar to or better than site runoff, and then it may be combined with site runoff and treated as described above.
- b. Process Water:
 - 1) Do not discharge high pH process water or wastewater (non-stormwater) that is generated onsite, including water generated during concrete grinding, rubblizing, washout, and hydrodemolition activities, to waters of the State, including wetlands. Water may be infiltrated upon approval of Engineer. Offsite disposal of concrete process water is subject to approval of Engineer.
 - 2) Treat all water generated onsite from construction or washing activities that is more turbid than site runoff separately until turbidity is the same or less than site runoff, and then it may be combined with site runoff and treated as described above. Water may be infiltrated upon approval of Engineer.
 - c. Offsite Water: Prior to disruption of normal watercourse, intercept offsite stormwater and pipe it either through or around the Project Site. This water shall not be combined with onsite stormwater. Discharge offsite water at its preconstruction outfall point preventing an increase in erosion below the site. Submit proposed method for performing this Work for Engineer's approval.
- L. Dispersion/Infiltration: Convey water only to dispersion or infiltration areas designated in the TESC Plan or to sites approved by Engineer. Water shall be conveyed to designated dispersion areas at a rate such that, when runoff leaves the area and enters waters of the State, turbidity standards are achieved. Convey water to designated infiltration areas at a rate that does not produce surface runoff.
- M. Detention/Retention Pond Construction: Whether permanent or temporary, construct before beginning other grading and excavation Work in the area that drains into that pond. Install temporary conveyances concurrently with grading in accordance with the TESC Plan so that newly graded areas drain to the pond as they are exposed.

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N. Pollution Control:

1. Use BMPs to prevent or minimize stormwater exposure to pollutants from spills; vehicle and equipment fueling, maintenance, and storage; other cleaning and maintenance activities; and waste handling activities. These pollutants include fuel, hydraulic fluid, and other oils from vehicles and machinery, as well as debris, leftover paints, solvents, and glues from construction operations. Implement the following BMPs when applicable:
 - a. List and describe all pollutants and hazardous material that would be used at the project site.
 - b. Procedures for inventory, storage, handling, and monitoring.
 - c. Written spill prevention and response procedures.
 - d. Employee training on spill prevention and proper disposal procedures.
 - e. Spill kits in all vehicles.
 - f. Regular maintenance schedule for vehicles and machinery.
 - g. Material delivery and storage controls.
 - h. Training and signage.
 - i. Covered storage areas for waste and supplies.

O. If Owner or Engineer orders the Work suspended, continue to control erosion, pollution, and runoff during the shutdown.

P. Nothing in this section shall relieve Contractor from complying with other Contract requirements.

Q. Before beginning work on the project, Contractor is responsible for completing and submitting a Construction General Stormwater Discharge Permit (1200-C) transfer form to Oregon Department of Environmental Quality (DEQ) to obtain ownership of the project's 1200-C permit.

1.04 SUBMITTALS

A. Informational Submittals:

1. In addition to the approved 1200-C permit, when a TESC Plan is included on Drawings, either adopt or modify the TESC Plan.
2. Submit the TESC plan proposed by the Contractor. Modified TESC Plans shall meet all requirements of the applicable jurisdictions.
 - a. The TESC Plan shall cover all areas that may be affected inside and outside the limits of the Project (including all Owner-provided sources, disposal sites, and haul roads, and all nearby land, streams, and other bodies of water).

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3. Provide a schedule for TESC Plan implementation and incorporate it into Contractor's progress schedule.
 - a. Allow at least 5 working days for Engineer to review any original or revised TESC Plan. Failure to approve all or part of any such Plan shall not make Owner liable to Contractor for any Work delays.
 - b. Obtain Engineer's approval of the TESC Plan and schedule before any Work begins.
4. List of all BMPs Contractor expects to use throughout the duration of the Project.
5. Product data sheets for all erosion control best management practices to be used on site during construction.

PART 2 PRODUCTS

2.01 BIOFILTER BAGS

- A. Minimum size 18-inch by 6-inch by 30-inch plastic mesh bags with 1/2-inch openings filled with approximately 45 pounds of clean, nontoxic 100 percent wood chips or wood shavings containing no fine materials or sediments.
- B. Wood Chips:
 1. Derived from softwood species not containing resin, tannin, or other compounds in quantities that would be detrimental to plant life, and meeting the following loose volume gradation:
 - a. 2-inch Sieve Size: 95 percent to 100 percent passing.
 - b. No. 4 Sieve Size: 0 percent to 30 percent passing.
- C. Wood Shavings: Provide shavings with 80 percent of the fibers 6 inches or longer between 0.030-inch-wide and 0.50-inch-wide, and between 0.017-inch-thick and 0.13-inch-thick.

2.02 CHECK DAMS

- A. Specified by Contractor with approval of Engineer.

2.03 CLEARING LIMIT FENCE

- A. Fence Fabric: UV stabilized, orange, high-density polyethylene or polypropylene mesh.
- B. Height: 4 feet minimum.

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- C. Support Posts: Wood or steel with sufficient strength and durability to support the fence through the life of the Project.

2.04 COMPOST SOCK

- A. Provide socks fabricated from of extra heavy weight biodegradable fabric, with a minimum strand thickness of 5 mils.
- B. Fill fabric with compost as specified in City of Albany Specification 601.01.02.
- C. Diameter: 18 inches minimum.
- D. Fabric: Clean, evenly woven, and free of encrusted concrete or other contaminating materials. Shall be free from cuts, tears, broken or missing yarns. Shall be free of thin, open, or weak areas. Shall be free of any type of preservative.
- E. Wood Stakes: Untreated softwood species, be 2-inch by 2-inch nominal dimension and 36 inches in length.

2.05 CONCRETE WASHOUT FACILITY

- A. Provide washout facility as shown on Drawings.

2.06 EROSION CONTROL BLANKET (MATTING)

- A. Refer to City of Albany Standard Specification 604.02.00 for Straw Matting.

2.07 INLET PROTECTION

- A. As shown on Drawings.

2.08 MULCH

- A. Straw Mulch:
 - 1. Clean salt hay or threshed straw of oats, wheat, barley, or rye.
 - 2. Air dried condition free of noxious weeds, seeds, and other materials detrimental to plant life. Hay is not acceptable. Provide weed-free documentation:
 - a. Certified Weed Free Straw using North American Weed Management Association (NAWMA) standards.

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- b. Provide documentation that material is steam or heat treated to kill seeds.
- c. Provide U.S. or state's Department of Agriculture laboratory test reports, dated within 90 days prior to date of application, showing there are no viable seeds in the straw.
3. Suitable for spreading with mulch blower equipment.
4. Average Stalk Length: 6 inches.
5. Seasoned before baling or loading.

B. Hydroseeding Mulch:

1. Specially processed wood fiber containing no growth or germination inhibiting factors.
2. Dyed suitable color to facilitate inspection of material placement.
3. Manufactured such that after addition and agitation in slurry tanks with water, material fibers become uniformly suspended to form homogenous slurry.
4. When hydraulically sprayed on ground, material will allow absorption and percolation of moisture.

2.09 OUTLET PROTECTION

- A. Size riprap or quarry spall to resist movement under design flows. Install at least 18 inches deep. Provide riprap or quarry spall material free of extraneous material.

2.10 PLASTIC COVERING

- A. Clear plastic meeting requirements of ASTM D4397 for polyethylene sheeting having a minimum thickness of 6 mils.

2.11 POLYACRYLAMIDE (PAM)

- A. Meet ANSI/NSF Standard 60 for drinking water treatment with an AMD content not to exceed 0.05 percent.
- B. Anionic, linear, and not cross-linked.
- C. Minimum average molecular weight greater than 5 mg/mole and minimum 30 percent charge density.
- D. 80 percent active ingredients minimum with moisture content not exceeding 10 percent by weight.
- E. Delivered in a dry granular or powder form.

2.12 SEEDING

- A. See Section 32 92 00, Turf and Grasses.

2.13 SILT (SEDIMENT) FENCE

- A. Geotextile: As specified in Oregon Department of Transportation 2021 Standard Specifications for Construction, Section 02320, Table 02320-3 for Sediment Fence.
- B. Reinforcing: Welded wire fabric, 14-gauge minimum with 2-inch by 4-inch mesh.
- C. Support Posts: As recommended by manufacturer of silt fence and meeting the following minimum specifications:
 - 1. Wood Posts: Minimum dimensions of 1-1/4-inch by 1-1/4-inch by the minimum length shown on Drawings.
 - 2. Steel Posts: Minimum weight of 0.90 pounds per foot.
- D. Fasteners: Heavy-duty wire staples at least 1-inch long, tie wires, or hog rings, as recommended by manufacturer of geotextile.

2.14 STABILIZED CONSTRUCTION ENTRANCE

- A. Construct a pad from stone, placed at least 8 inches deep and not less than 50 feet long.
- B. Provide aggregate free of extraneous materials that may cause or contribute to track out.
- C. Place separation geotextile under the rock to prevent fine sediment from pumping up into the rock pad. Provide geotextile as specified in Oregon Department of Transportation 2021 Standard Specifications for Construction, Section 02320, Table 02320-4 for Subgrade Geotextile.
- D. Use of constructed or constructed/manufactured steel plates with ribs (such as, shaker/rumble plates or corrugated steel plates) for entrance/exit access is allowable.

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2.15 STRAW BALE BARRIER

- A. Straw:
 - 1. Air dried condition free of noxious weeds, seeds, and other materials detrimental to plant life. Hay is not acceptable. Provide weed-free documentation:
 - a. Certified Weed Free Straw using North American Weed Management Association (NAWMA) standards.
 - b. Provide documentation that material is steam or heat treated to kill seeds.
 - c. Provide U.S. or state's Department of Agriculture laboratory test reports, dated within 90 days prior to date of application, showing there are no viable seeds in the straw.
- B. Straw Mulch: Suitable for spreading with mulch blower equipment.
- C. Posts for Straw Bales: 2-inch by 2-inch untreated wood or commercially manufactured metal posts.

2.16 STREET CLEANING

- A. Use self-propelled pickup street sweeper(s). Mechanical broom sweepers are not allowed where environmental concerns exist about storm water pollution or air quality.

2.17 TACKIFIERS

- A. Biodegradable Hydraulically Applied Erosion Control Products (HECPs) in a dry condition, free of noxious weeds, seeds, chemical printing ink, germination inhibitors, herbicide residue, chlorine bleach, rock, metal, plastic, and other materials detrimental to plant life. Up to 5 percent by weight may be photodegradable material.
- B. Suitable for spreading with a hydroseeder.
- C. Furnish HECPs premixed by the manufacturer. Under no circumstances will field mixing of additives or components be acceptable.

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- D. Provide test results, dated within 3 years prior to the date of application, from an independent, accredited laboratory, as approved by Engineer, showing that the product meets the HECP requirements in Table 7.

Table 7 HECP Requirements		
Properties	Test Method	Requirements
Acute Toxicity	EPA-821-R-02-012 Methods for Measuring Acute Toxicity of Effluents. Test leachate from recommended application rate receiving 2 inches of rainfall per hour using static test for No-Observed-Adverse-Effect-Concentration (NOEC).	Four replicates are required with no statistically significant reduction in survival in 100 percent leachate for a Daphnid at 48 hours and <i>Oncorhynchus mykiss</i> (rainbow trout) at 96 hours.
Solvents	EPA 8260B	Benzene: < 0.03 mg/kg Methylene chloride: < 0.02 mg/kg Naphthalene: < 5 mg/kg Tetrachloroethylene: < 0.05 mg/kg Toluene: < 7 mg/kg Trichloroethylene: < 0.03 mg/kg Xylenes: < 9 mg/kg
Heavy Metals	EPA 6020A Total Metals	Antimony: < 4 mg/kg Arsenic: < 6 mg/kg Barium: < 80 mg/kg Boron: < 100 mg/kg Cadmium: < 2 mg/kg Chromium: < 2 mg/kg Copper: < 5 mg/kg Lead: < 5 mg/kg Mercury: < 2 mg/kg Nickel: < 2 mg/kg Selenium: < 10 mg/kg Strontium: < 30 mg/kg Zinc: < 5 mg/kg

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Table 7 HECP Requirements		
Properties	Test Method	Requirements
Water Holding Capacity	ASTM D7367	900 percent minimum
Organic Matter Content	ASTM D2974	90 percent minimum
Moisture Content	ASTM D2974	15 percent
Seed Germination Enhancement	ASTM D7322	Long-Term: 420 percent minimum Moderate-Term: 400 percent minimum Short-Term: 200 percent minimum

2.18 TEMPORARY CURB

- A. Temporary curbs may consist of asphalt, concrete, sand bags, compost socks, wattles, or geotextile/plastic encased berms of sand or gravel, or as approved by Engineer.

2.19 TEMPORARY SEDIMENT TRAP

- A. Temporary ponding area with a rock weir or perforated riser pipe at the outlet, formed by excavation or constructing a weir. Specified by Contractor with approval of Engineer.

2.20 TIRE WHEEL WASH FACILITY

- A. Specified by Contractor with approval of Engineer. Wheel wash facilities should have a non-erosive base, and a small grade change, 6 inches to 12 inches for a 10-foot-wide pond, to allow sediment to flow to low side of pond to help prevent re-suspension of sediment. A drainpipe with a 2-foot to 3-foot riser should be installed at low side of pond to allow for cleaning and refilling. Pond should be deep enough to hold 14 inches of water after displacement. Alternatively, pressure washing combined with an adequately-sized and adequately-surfaced pad with direct drainage to a 10-foot by 10-foot sump can be very effective.

2.21 WATTLES

- A. Cylinders of biodegradable plant material such as weed-free straw, coir, compost, wood chips, excelsior, or wood fiber or shavings encased within biodegradable netting.

- B. Diameter: 5 inches minimum.
- C. Netting Material: Clean, evenly woven, and free of encrusted concrete or other contaminating materials such as preservatives. Also free from cuts, tears, or weak places with a minimum lifespan of 6 months.
- D. Compost Filler: Coarse compost, wood chips, or wood shavings.
- E. Wood Stakes: Untreated softwood species, 2-inch by 2-inch nominal dimension and 36 inches in length.

2.22 WOOD CHIPS AND WOOD SHAVINGS

- A. Wood Chips: Derived from softwood species not containing resin, tannin, or other compounds in quantities that would be detrimental to plant life, and meeting the following loose volume gradation:
 - 1. 2-inch Sieve Size: 95 percent to 100 percent passing.
 - 2. No. 4 Sieve Size: 0 percent to 30 percent passing.
- B. Wood Shavings: Provide shavings with 80 percent of the fibers 6 inches or longer between 0.030 inch wide and 0.50 inch wide, and between 0.017 inch thick and 0.13 inch thick.

PART 3 EXECUTION

3.01 PREPARATION

- A. Engineer's acceptance of the TESC Plan is required prior to starting earth disturbing activities.
- B. Include proposed stockpile areas and installation of temporary erosion control devices, ditches, or other facilities in Work phasing plans.
- C. Areas designated for Contractor's use during Project may be temporarily developed as specified to provide working, staging, and administrative areas. Include control of sediment from these areas in the TESC Plan.
- D. Check Dams: Install check dams as soon as construction will allow, or when designated by Engineer. Contractor may substitute a different check dam, in lieu of what is specified in the Contract, with approval of Engineer. Check dam is a temporary or permanent structure, built across a minor channel. Water shall not flow through check dam structure. Construct check dams to create a ponding area upstream of dam to allow pollutants to settle, with water from increased flows channeled over a spillway in check dam. Construct

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check dam to prevent erosion in area below spillway. Place check dams perpendicular to flow of water and install in accordance with the Drawings. Extend outer edges up sides of conveyance to prevent water from going around check dam. Provide check dams of sufficient height to maximize detention, without causing water to leave ditch. Place sandbags so that initial row makes tight contact with ditch line for length of dam. Stagger subsequent rows so center of bag is placed over space between bags on previous lift.

- E. Clearing Limit Fencing: Install clearing limit fencing in accordance with Drawings and along clearing limits as specified.
- F. Compost Sock: Exercise care when installing compost socks to ensure method of installation minimizes disturbance of waterways and prevents sediment or pollutant discharge into waterbodies. Lace compost socks together, end-to-end, with coir rope to create a continuous length. Bury loose ends of continuous length 3 feet to 5 feet laterally into the bankslope. Install the upper surface of compost sock parallel to slope. Provide finished grades of a natural appearance with smooth transitions. Secure compost sock with wood stakes or live stakes of species as indicated on the Drawings. Drive stakes into place centered on top of compost sock and spaced 3 feet on center throughout length of sock.
- G. Concrete Washout Facility: Construct as shown on Drawings and when the Contract requires a tire wash (in conjunction with a stabilized entrance), include details for tire wash and method for containing and treating sediment-laden runoff as part of the TESC Plan. All vehicles leaving the Site shall stop and wash sediment from their tires. Keep the water level 12 inches to 14 inches deep. Change wash water a minimum of once per day. Polymers may be used to promote coagulation and flocculation in a closed-loop system. Polyacrylamide (PAM) added to the wheel wash water at a rate of 0.25 pound to 0.5 pound per 1,000 gallons of water increases effectiveness and reduces cleanup time.
- H. Erosion Control Blanket (Matting): Temporary Erosion Control Blankets are used as an erosion prevention device and to enhance establishment of vegetation. Install erosion control blankets according to manufacturer's recommendations.
 - 1. Erosion control blankets with an open area of 60 percent or greater may be installed prior to seeding and fertilizing. Install blankets with less than 60 percent open space immediately following seeding and fertilizing operation.

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2. Select erosion control blanket material for an area based on the intended function; slope or ditch stabilization and Site-specific factors including soil, slope gradient, rainfall, and flow exposure. Do not use erosion Control Blankets on slopes or in ditches that exceed manufacturer's recommendations.
 3. Install erosion control blankets where shown on Drawings, and on ditches and slopes that are 3:1 and steeper.
- I. High Visibility Fencing: Install high visibility fencing in accordance with the Drawings.
- J. Inlet Protection: Install inlet protection below or above, or as a prefabricated cover at each inlet grate, as shown on the Drawings. Install inlet protection devices prior to beginning clearing, grubbing or earthwork activities. Geotextile fabric used in prefabricated inlet protection devices must meet or exceed the requirements for Moderate Survivability and minimum filtration properties. When depth of accumulated sediment and debris reaches approximately one-half the height of an internal device or one-third the height of external device (or less when so specified by the manufacturers) or as designated by Engineer, remove deposits and stabilize onsite.
1. Below Inlet Grate:
 - a. Prefabricated units specifically designed for inlet protection.
 - b. Must remain securely attached to drainage structure when fully loaded with sediment and debris or at the maximum level of sediment and debris specified by manufacturer.
 2. Above Inlet Grate:
 - a. Devices may be silt fence, sandbags, or prefabricated units specifically designed for inlet protection.
 - b. Must remain securely in place around drainage structure under all conditions.
 3. Inlet Grate Cover:
 - a. Prefabricated units specifically designed for inlet protection and:
 - 1) Be a sewn geotextile fabric unit fitted to individual grate and completely enclosing grate.
 - 2) Have built-in lifting devices to allow manual access of stormwater system.
 - 3) Use an orange monofilament geotextile fabric.
 - b. Check dams or functionally equivalent devices may be used as inlet protection devices with approval of Engineer.

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- K. Mulch: Furnish, haul, and evenly apply at rates indicated and spread on seeded areas within 48 hours after seeding unless otherwise specified.
1. Distribute straw mulch material with an approved mulch spreader that uses forced air to blow mulch material on seeded areas. Apply straw mulch at rate of 2 tons per acre.
 2. Apply wood strand mulch by hand or by straw blower on seeded areas.
 3. Hydroseeding Mulch:
 - a. Hydraulically apply hydroseeding mulch at the rate of 2,000 pounds per acre for slopes flatter than 2H:1V and for slopes 2H:1V and steeper, apply at rate of 3,000 pounds per acre with no more than 2,000 pounds applied in a single lift.
 - b. Mulch may be applied with seed and fertilizer in moist climates. In dry climates, apply seed and fertilizer in a single application followed by mulch application.
 - c. Provide mulch suitable for application with a hydroseeder.
 4. Cover temporary seed applied outside application windows established in Section 32 92 00, Turf and Grasses, with a mulch as designated by Engineer.
 5. Mulch areas not accessible by mulching equipment by approved hand methods.
- L. Outlet Protection: Provide outlet protection to prevent scour at outlets of ponds, pipes, ditches, or other conveyances.
- M. Plastic Covering: Use clear plastic covering to promote seed germination when seeding is performed outside of specified dates. Use black plastic covering for stockpiles or other areas where vegetative growth is unwanted. Place plastic with at least a 12-inch overlap of all seams. Install and maintain plastic cover to prevent water from cutting under the plastic and to prevent cover from blowing open in the wind.
- N. Polyacrylamide (PAM): See Tackifiers.
- O. Seeding: See Section 32 92 00, Turf and Grasses.
- P. Silt (Sediment) Fence:
1. Silt fence shall be installed in accordance with Drawings.
 2. Attach geotextile to posts and support system using staples, wire, or in accordance with manufacturer's recommendations. Geotextile shall be sewn together at the point of manufacture, or at a location approved by Engineer, to form geotextile lengths as required.

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3. Provide wood or steel support posts at sewn seams and overlaps and as shown on the Drawings and necessary to support fence.
 4. When sediment deposits reach approximately one-third the height of the silt fence, remove and stabilize deposits.
- Q. Stabilized Construction Entrance: Construct temporary stabilized construction entrance in accordance with the Drawings, prior to beginning any clearing, grubbing, earthwork, or excavation. When stabilized entrance no longer prevents track out of sediment or debris, either rehabilitate existing entrance to original condition or construct a new entrance.
- R. Street Cleaning: Use self-propelled pickup street sweepers whenever required by Engineer to prevent transport of sediment and other debris off Project Site. Provide street sweepers designed and operated to meet air quality standards. Street washing with water will require approval by Engineer. Intentional washing of sediment into storm sewers or drainage ways must not occur. Vacuuming or dry sweeping and material pickup must be used to cleanup released sediments.
- S. Tackifiers:
1. Mix and apply tackifier in accordance with manufacturer's recommendations. If applied with a hydroseeder, add mulch as a tracer at a rate of 125 pounds to 250 pounds per acre to visibly aid uniform application.
 2. Soil Binding Using Polyacrylamide (PAM): Apply PAM on bare soil completely dissolved and mixed in water or applied as a dry powder. Apply dissolved PAM at a rate of not more than 2/3 pound per 1,000 gallons of water per acre. Apply a minimum of 200 pounds per acre of Short-Term Mulch with the dissolved PAM. Dry powder applications may be at a rate of 5 pounds per acre using a hand-held fertilizer spreader or a tractor-mounted spreader.
 - a. Apply PAM only to areas that drain to completed sedimentation control BMPs in accordance with the TESC Plan. PAM may be reapplied on actively worked areas after a 48-hour period.
 - b. PAM shall not be applied during rainfall or to saturated soils.
- T. Temporary Curb: Provide temporary curbs to divert or redirect water around erodible soils. Temporary curbs shall be installed along pavement edges to prevent runoff from flowing onto erodible slopes. Water shall be directed to areas where erosion can be controlled. Temporary curbs shall be a minimum of 4 inches in height. Ponding shall not be in roadways.

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- U. Temporary Sediment Trap: Form trap by constructing a berm or by partial or complete excavation. Direct the discharge flow to a stabilized conveyance outlet or level spreader.
- V. Tire Wheel Wash Facility: When the Contract requires a tire wash (in conjunction with a stabilized entrance), include details for tire wash and method for containing and treating sediment-laden runoff as part of the TESC Plan. All vehicles leaving the Site shall stop and wash sediment from their tires. Keep the water level 12 inches to 14 inches deep. Change wash water a minimum of once per day. Polymers may be used to promote coagulation and flocculation in a closed-loop system. Polyacrylamide (PAM) added to the wheel wash water at a rate of 0.25 pound to 0.5 pound per 1,000 gallons of water increases effectiveness and reduces cleanup time.
- W. Wattles: Install wattles as soon as construction will allow or when designated by Engineer. Begin trench construction and wattle installation at base of slope and work uphill. Spread excavated material evenly along the uphill slope and compact using hand tamping or other method approved by Engineer. On gradually sloped or clay-type soils, provide trenches 2 inches to 3 inches deep. On loose soils, in high rainfall areas, or on steep slopes, provide trenches 3 inches to 5 inches deep, or half the thickness of the wattle. Exercise care when installing wattles to minimize disturbance of waterways and prevent sediment or pollutant discharge into waterbodies.
- X. Wood Chips and Wood Shavings: Install in accordance with the Drawings.

3.02 ADDITIONAL REQUIREMENTS

- A. Natural Buffer or Equivalent:
 - 1. Unless natural buffer between the Project Site and receiving waters has previously been eliminated by pre-existing development disturbances, comply with one of the following alternatives if stormwater from construction will discharge to surface water:
 - a. Provide a 50-foot, undisturbed natural buffer between construction disturbances and surface water.
 - b. Provide an undisturbed natural buffer that is less than 50 feet supplemented by additional erosion and sediment controls, which in combination, achieve a sediment load reduction that is equivalent to a 50-foot buffer.
 - c. If it is infeasible to provide an undisturbed natural buffer of any size, implement erosion and sediment controls that achieve a sediment load reduction that is equivalent to a 50-foot buffer.

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- B. Other Sediment Barriers (such as biobags): Remove sediment in accordance with the 1200-C permit requirements and before sediment reaches 2 inches depth above ground height. Remove sediment before BMP removal.

3.03 MAINTENANCE

- A. The ESCP measures described in this specification are minimum requirements for anticipated Site conditions. During the construction period, upgrade these measures as needed to comply with all applicable local, state, and federal erosion and sediment control regulations.
- B. Comply with the requirements of the Project's 1200-C permit.
- C. Maintain erosion and sediment control BMPs so they properly perform their function until Engineer determines they are no longer needed.
- D. Construction activities must avoid or minimize excavation and creation of bare ground during wet weather.
- E. The intentional washing of sediment into storm sewers or drainage ways must not occur. Vacuuming or dry sweeping and material pickup must be used to cleanup released sediments.
- F. Inspect BMPs in accordance with the schedule in the Construction Stormwater Discharge Permit(s) or as directed by Engineer.
- G. Complete an inspection report within 24 hours of an inspection. Each inspection report shall be signed and identify corrective actions. Document that corrective actions are performed within 7 days of identification. Keep a copy of all inspection reports at the Site or at an easily accessible location.
- H. Unless otherwise specified, remove deposits before the depth of accumulated sediment and debris reaches approximately height of BMP. Dispose of debris or contaminated sediment at approved locations. Clean sediments may be stabilized onsite using BMPs as approved by Engineer.
- I. Sediment Fence: Remove trapped sediment before it reaches one-third of the above ground fence height and before fence removal.
- J. Other Sediment Barriers (such as biobags): Remove sediment before it reaches 2 inches depth above ground height and before BMP removal.
- K. Catch Basins: Clean before retention capacity has been reduced by 50 percent.

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- L. Sediment Basins and Sediment Traps: Remove trapped sediments before design capacity has been reduced by 50 percent and at completion of Project.
- M. Initiate repair or replacement of damaged erosion and sediment control BMPs immediately, and work completed by end of next workday. Significant replacement or repair must be completed within 7 days, unless infeasible.
- N. Within 24 hours, remediate any significant sediment that has left construction site. Investigate cause of the sediment release and implement steps to prevent a recurrence of discharge within same 24 hours. Perform in-stream cleanup of sediment according to applicable regulations.
- O. At end of each workday, stabilize or cover soil stockpiles or implement other BMPs to prevent discharges to surface waters or conveyance systems leading to surface waters.
- P. Temporarily stabilize soils at end of shift before holidays and weekends, if needed. Ensure soils are stable during rain events at all times of year.
- Q. Initiate stabilization by no later than end of next workday after construction work in an area has stopped permanently or temporarily.
- R. Within 14 days of initiating stabilization or as specified in permit, either seed or plant stabilized area (see Section 32 92 00, Turf and Grasses); or apply non-vegetative measures and cover all areas of exposed soil. Seed dry areas as soon as Site conditions allow. Ensure that vegetation covers at least 70 percent of stabilized area. In areas where Contractor's activities have compromised erosion control functions of existing grasses, overseed existing grass. Non-vegetative measures may include blown straw and a tackifier, loose straw, or an adequate covering of compost mulch. Complete initial stabilization within 7 days if storm water discharges to surface waters impaired for sediment or nutrients, or high-quality waters.
- S. Provide permanent erosion control measures on all exposed areas. Do not remove temporary sediment control practices until permanent vegetation or other cover of exposed areas is established. However, do remove all temporary erosion control measures as exposed areas become stabilized, unless doing so conflicts with local requirements. Properly dispose of construction materials and waste, including sediment retained by temporary BMPs.

3.04 EMERGENCY MATERIALS

- A. Provide, stockpile, and protect the following emergency erosion and sediment control materials on the Project Site for unknown weather or erosion conditions. Emergency materials are in addition to other erosion control materials required to implement and maintain the TESC Plan. Replenish emergency materials as they are used. Remove all unused emergency materials from the Project Site at completion of the Project.

Item	Quantity
Silt (sediment) fence	300 ft
Plastic sheeting	1,000 sq. ft.
Rope	1,000 ft
Sand bags (empty, to be filled as needed)	50
Straw bales	30
Biofilter bags (with stakes)	50
Water pump and hose	One

3.05 REMOVAL

- A. When Engineer determines that an erosion control BMP is no longer required, remove BMP and all associated hardware from the Project limits. When materials are biodegradable, Engineer may approve leaving temporary BMP in place.
- B. Permanently stabilize all bare and disturbed soil after removal of erosion and sediment control BMPs. Dress sediment deposits remaining after BMPs have been removed to conform to existing grade. Prepare and seed graded area. If installation and use of erosion control BMPs have compacted or otherwise rendered soil inhospitable to plant growth, such as construction entrances, take measures to rehabilitate soil to facilitate plant growth. This may include, but is not limited to, ripping the soil, incorporating soil amendments, or seeding with specified seed.

END OF SECTION

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SUBMITTALS

A. Informational Submittals:

1. Submit prior to application for final payment.
 - a. Record Documents: As required in General Conditions.
 - b. Approved Shop Drawings and Samples: As required in the General Conditions.
 - c. Special bonds, Special Guarantees, and Service Agreements.
 - d. Consent of Surety to Final Payment: As required in General Conditions.
 - e. Releases or Waivers of Liens and Claims: As required in General Conditions.
 - f. Releases from Agreements.
 - g. Final Application for Payment: Submit in accordance with procedures and requirements stated in Section 01 29 00, Payment Procedures.
 - h. Extra Materials: As required by individual Specification sections.

1.02 RECORD DOCUMENTS

A. Quality Assurance:

1. Furnish qualified and experienced person, whose duty and responsibility shall be to maintain record documents.
2. Accuracy of Records:
 - a. Coordinate changes within record documents, making legible and accurate entries on each sheet of Drawings and other documents where such entry is required to show change.
 - b. Purpose of Project record documents is to document factual information regarding aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive Site measurement, investigation, and examination.
3. Make entries within 24 hours after receipt of information that a change in the Work has occurred.

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4. Prior to submitting each request for progress payment, request Engineer's review and approval of current status of record documents. Failure to properly maintain, update, and submit record documents may result in a deferral by Engineer to recommend whole or any part of Contractor's Application for Payment, either partial or final.

1.03 RELEASES FROM AGREEMENTS

- A. Furnish Owner written releases from property owners or public agencies where side agreements or special easements have been made, or where Contractor's operations have not been kept within the Owner's construction right-of-way.
- B. In the event Contractor is unable to secure written releases:
 1. Inform Owner of the reasons.
 2. Owner or its representatives will examine the Site, and Owner will direct Contractor to complete the Work that may be necessary to satisfy terms of the side agreement or special easement.
 3. Should Contractor refuse to perform this Work, Owner reserves right to have it done by separate contract and deduct cost of same from Contract Price, or require Contractor to furnish a satisfactory bond in a sum to cover legal Claims for damages.
 4. When Owner is satisfied that the Work has been completed in agreement with Contract Documents and terms of side agreement or special easement, right is reserved to waive requirement for written release if: (i) Contractor's failure to obtain such statement is due to grantor's refusal to sign, and this refusal is not based upon any legitimate Claims that Contractor has failed to fulfill terms of side agreement or special easement, or (ii) Contractor is unable to contact or has had undue hardship in contacting grantor.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 MAINTENANCE OF RECORD DOCUMENTS

- A. General:
 1. Promptly following commencement of Contract Times, secure from Engineer at no cost to Contractor, one complete set of Contract Documents. Drawings will be full size.
 2. Label or stamp each record document with title, "RECORD DOCUMENTS," in neat large printed letters.

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3. Record information concurrently with construction progress and within 24 hours after receipt of information that change has occurred. Do not cover or conceal Work until required information is recorded.
- B. Preservation:
1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
 2. Make documents and Samples available at all times for observation by Engineer.
- C. Making Entries on Drawings:
1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.
 - a. Color Coding:
 - 1) Green when showing information deleted from Drawings.
 - 2) Red when showing information added to Drawings.
 - 3) Blue and circled in blue to show notes.
 2. Date entries.
 3. Call attention to entry by “cloud” drawn around area or areas affected.
 4. Legibly mark to record actual changes made during construction, including, but not limited to:
 - a. Depths of various elements of foundation in relation to finished first floor data if not shown or where depth differs from that shown.
 - b. Horizontal and vertical locations of existing and new Underground Facilities and appurtenances, and other underground structures, equipment, or Work. Reference to at least two measurements to permanent surface improvements.
 - c. Location of internal utilities and appurtenances concealed in the construction referenced to visible and accessible features of the structure.
 - d. Locate existing facilities, piping, equipment, and items critical to the interface between existing physical conditions or construction and new construction.
 - e. Changes made by Addenda and Field Orders, Work Change Directive, Change Order, and Engineer’s written interpretation and clarification using consistent symbols for each and showing appropriate document tracking number.

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5. Dimensions on Schematic Layouts: Show on record drawings, by dimension, the centerline of each run of items such as are described in previous subparagraph above.
 - a. Clearly identify the item by accurate note such as “cast iron drain,” “galv. water,” and the like.
 - b. Show, by symbol or note, vertical location of item (“under slab,” “in ceiling plenum,” “exposed,” and the like).
 - c. Make identification so descriptive that it may be related reliably to Specifications.

3.02 FINAL CLEANING

- A. At completion of the Work or of a part thereof and immediately prior to Contractor’s request for certificate of Substantial Completion; or if no certificate is issued, immediately prior to Contractor’s notice of completion, clean entire Site or parts thereof, as applicable.
 1. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to Owner.
 2. Remove grease, dirt, dust, paint or plaster splatter, stains, labels, fingerprints, and other foreign materials from exposed surfaces.
 3. Repair, patch, and touch up marred surfaces to specified finish and match adjacent surfaces.
 4. Broom clean exterior paved driveways and parking areas.
 5. Hose clean sidewalks, and others hard surfaces.
 6. Rake clean all other surfaces.
 7. Leave water courses, gutters, and ditches open and clean.
- B. Use only cleaning materials recommended by manufacturer of surfaces to be cleaned.

END OF SECTION

SECTION 01 88 15
ANCHORAGE AND BRACING

PART 1 GENERAL

1.01 SUMMARY

- A. This section covers requirements for anchorage and bracing of equipment, distribution systems, and other nonstructural components required in accordance with the ICC 2021 International Building Code (IBC), for seismic, wind, gravity, soil, and operational loads.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Institute of Steel Construction (AISC) 360, Specification for Structural Steel Buildings.
 2. American Society of Civil Engineers (ASCE): ASCE 7, Minimum Design Loads for Buildings and Other Structures.
 3. International Code Council (ICC): International Building Code (IBC).
 4. 2022 Oregon Structural Specialty Code.

1.03 DEFINITIONS

- A. Authority Having Jurisdiction (AHJ): Permitting building agency; may be a federal, state, local, or other regional department, or individual including building official, fire chief, fire marshal, chief of a fire prevention bureau, labor department, or health department, electrical inspector; or others having statutory authority. AHJ may be Owner when authorized to be self-permitting by governmental permitting agency or when no governmental agency has authority.
- B. Designated Seismic System: Architectural, electrical, and mechanical system or their components for which component importance factor is greater than 1.0.

1.04 DESIGN AND PERFORMANCE REQUIREMENTS

- A. General:
1. Anchorage and bracing systems shall be designed by a qualified professional engineer registered in the State of Oregon.

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2. Design anchorage into concrete including embedment in accordance with ACI 318-19; Chapter 17, and Project Specifications.
 - a. Unless otherwise noted, design for cracked concrete condition.
3. Design anchorage and bracing of architectural, mechanical, and electrical components and systems in accordance with this section, unless a design is specifically provided within Contract Documents or where exempted hereinafter.
4. Design attachments, braces, and anchors for equipment, components, and distribution systems to structure for gravity, seismic, wind, and operational loading.
5. Anchor and brace piping and ductwork, whether exempt or not exempt for this section, so that lateral or vertical displacement does not result in damage or failure to essential architectural, mechanical, or electrical equipment.
6. Architectural Components: Includes, but are not limited to, nonstructural walls and elements, partitions, cladding and veneer, access flooring, signs, cabinets.
7. Provide supplementary framing where required to transfer anchorage and bracing loads to structure.
8. Adjust equipment pad sizes or provide additional anchorage confinement reinforcing to provide required anchorage capacities.
9. Design anchorage and bracing for:
 - a. Equipment weighing more than 20 pounds that has center of mass located more than 4 feet above adjacent finished floor.
 - b. Mechanical and electrical components that are not provided with flexible connections between components and associated ductwork, piping, or conduit.
 - c. Distribution systems that weigh more than 5 pounds per foot that are mounted more than 4 feet above adjacent finished floor.
10. Design seismic anchorage and bracing for Designated Seismic Systems regardless of weight or mounting height.
 - a. Component Important Factor:
 - 1) I_p equals 1.0, unless noted otherwise.
 - 2) I_p shall be taken as 1.5 if any of the following conditions apply:
 - a) Component is required to function for life-safety purposes after an earthquake, including fire protection sprinkler systems and egress stairways.
 - b) Component contains hazardous materials.
 - c) Component is in or attached to Risk Category IV structure and is needed for continued operation of facility or its failure could impair continued operation of facility.

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11. For components exempted from design requirements of this section, provide bolted, welded, or otherwise positively fastened attachments to supporting structure.

B. Design Loads:

1. Risk Category II.
2. Gravity: Design anchorage and bracing for self-weight and superimposed loads on components and equipment.
3. Wind: Design anchorage and bracing for Risk Category II, Exposure D, 98 mph, for exposed architectural components and exterior and wind-exposed mechanical and electrical equipment.
4. Operational:
 - a. For loading supplied by equipment manufacturer for IBC required load cases.
 - b. Loads may include equipment vibration, torque, thermal effects, effects of internal contents (weight and sloshing), water hammer, and other load-inducing conditions.
 - c. Locate braces to minimize vibration to or movement of structure.
 - d. For vibrating loads, use anchors meeting requirements and designated capacities for vibratory loading per manufacturer's ICC-ES report.
5. Seismic:
 - a. In accordance with OSSC 2022 and ASCE 7.
 - b. Design anchorage and bracing for design criteria listed on General Structural Notes on Drawings.
 - c. Design anchorages for parts or elements of architectural, mechanical, and electrical systems in accordance with provisions of IBC and following Site-specific seismic criteria, unless noted otherwise on Drawings:
 - 1) Site-Specific Spectral Response Coefficients:
 - a) Short Period Mapped Maximum Considered Earthquake Acceleration, 5 Percent Damped: S_S equals 0.801 g.
 - b) One Period Mapped Maximum Considered Earthquake Acceleration, 5 Percent Damped: S_1 equals 0.416 g.
 - c) Short Period Design Spectral Response Acceleration, 5 Percent Damped: SDS equals 0.63 g.
 - d) Site Modified Spectral Acceleration: SMS equals 0.945 g.
 - 2) Site Class: D.

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- d. Design forces for anchors in concrete shall be in accordance with ASCE 7, Section 13.4.2 as applicable for Project Seismic Design Category.

C. Seismic Design Requirements:

1. Nonstructural Components: Design as nonbuilding structures for components with weights greater than or equal to 25 percent of effective seismic weight of overall structure.
2. Analyze local region of body of nonstructural component for load transfer of anchorage attachment if component $I_p = 1.5$.
3. Provide support drawings and calculations for electrical distribution components if any of the following conditions apply:
 - a. I_p is equal to 1.5 and conduit diameter is greater than 2.5-inch trade size.
 - b. I_p is equal to 1.5 and the total weight of bus duct, cable tray, or conduit supported by trapeze assemblies exceeds 10 pounds per foot.
 - c. Supports are cantilevered up from floor.
 - d. Supports include bracing to limit deflection and are constructed as rigid welded frames.
 - e. Attachments utilize spot welds, plug welds, or minimum size welds as defined by AISC.
4. Other seismic design and detailing information identified in ASCE 7, Chapter 13, is required to be provided for new architectural, mechanical and electrical components, systems, or equipment.

1.05 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:
 - a. List of architectural, mechanical, and electrical equipment requiring Contractor-designed anchorage and bracing, unless specifically exempted.
 - b. Manufacturers' engineered seismic and non-seismic hardware product data.
 - c. Attachment assemblies' drawings including seismic attachments; include connection hardware, braces, and anchors or anchor bolts for nonexempt components, equipment, and systems.
 - d. Submittal will be rejected if proposed anchorage method would create excessive stress to supporting member. Revise anchorages and strengthen structural support to eliminate overstressed condition.

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B. Informational Submittals:

1. Anchorage and Bracing Calculations: For attachments, braces, and anchorages, include IBC and Project-specific criteria, in addition to manufacturer's specific criteria used for design; sealed by a civil or structural engineer registered in the State of Oregon.
2. Manufacturer's hardware installation requirements.

C. Deferred Submittals:

1. Submitted seismic anchorage drawings and calculations are identified as IBC deferred submittals and will be submitted to and must be accepted by AHJ prior to installation of component, equipment, or distribution system.
2. Submit deferred Action Submittals such as Shop Drawings with supporting deferred informational submittals such as calculations no less than 4 weeks in advance of installation of component, equipment or distribution system to be anchored to structure.

1.06 SOURCE QUALITY CONTROL

- A. Contractor and supplier responsibilities to accommodate Owner-furnished shop fabrication related special inspections and testing are provided in Project's Statement of Special Inspections in Supplement located at the end of Section 01 45 33, Special Inspection, Observation, and Testing, and Section 01 45 33, Special Inspection, Observation, and Testing.
- B. Provide all other specified, regulatory required, or required repair inspection and testing.
- C. All welding shall comply with AWS D1.1/D1.1M.
 1. Welders and welding procedures shall be qualified by the Manufacturer.
 2. Contractor's AWS QC1 Certified Welding Inspector shall oversee welding operations and provide 100 percent visual inspection at suitable intervals before, during and after welding, as required by AWS D1.1, Clause 8.1.2.1.

PART 2 PRODUCTS

2.01 GENERAL

- A. Design and construct attachments and supports transferring seismic and nonseismic loads to structure of materials and products suitable for application and in accordance with design criteria shown on Drawings and nationally recognized standards.
- B. Concrete anchors for light poles shall be embedded anchors, designed by the manufacturer. Provide anchor bolts of the size, minimum embedment, and spacing designated in calculations submitted by Contractor and accepted by Engineer.
- C. Provide embedded or post-installed concrete anchors for anchorage of other equipment to concrete slabs and bases. Provide anchors of the size, minimum embedment, and spacing designated in calculations submitted by Contractor and accepted by Engineer.
- D. Do not use powder-actuated fasteners or sleeve anchors for seismic attachments and anchorage where resistance to tension loads is required. Do not use expansion anchors, other than undercut anchors, for nonvibration isolated mechanical equipment rated over 10 hp.

PART 3 EXECUTION

3.01 GENERAL

- A. Make attachments, bracing, and anchorage in such a manner that component lateral force is transferred to lateral force resisting system of structure through a complete load path.
- B. Design, provide, and install overall seismic anchorage system to provide restraint in all directions, including vertical, for each component or system so anchored.
- C. Provide snubbers in each horizontal direction and vertical restraints for components mounted on vibration isolation systems where required to resist overturning.

- D. Provide piping anchorage that maintains design flexibility and expansion capabilities at flexible connections and expansion joints.
 - 1. Piping and ductwork suspended more than 12 inches below supporting structure shall be braced for seismic effects to avoid significant bending of hangers and their attachments.
- E. Anchor tall and narrow equipment such as motor control centers and telemetry equipment at base and within 12 inches from top of equipment, unless approved otherwise by Engineer.
- F. Do not attach architectural, mechanical, or electrical components to more than one element of a building structure at a single restraint location where such elements may respond differently during a seismic event. Do not make such attachments across building expansion and contraction joints.

3.02 INSTALLATION

- A. Do not install components or their anchorages or restraints prior to review and acceptance by Engineer and AHJ.
- B. Notify Engineer upon completion of installation of seismic restraints in accordance with Section 01 45 33, Special Inspection, Observation, and Testing.

3.03 FIELD QUALITY ASSURANCE AND QUALITY CONTROL

- A. Owner-Furnished Quality Assurance, in accordance with IBC Chapter 17 requirements, is provided in Statement of Special Inspections Plan in Supplement located at end of Section 01 45 33, Special Inspection, Observation, and Testing. Contractor responsibilities and related information are included in Section 01 45 33, Special Inspection, Observation, and Testing.
- B. Provide any other specified, regulatory required, or required repair verification inspection and testing that is not listed in Statement of Special Inspections.

END OF SECTION

CITY OF ALBANY
STANDARD SPECIFICATIONS

[Standard Construction Specifications \(cityofalbany.net\)](http://cityofalbany.net)

**SPECIAL PROVISIONS TO THE
CITY OF ALBANY STANDARD
SPECIFICATIONS**

DIVISION 1 – GENERAL REQUIREMENTS

101 APPLICATIONS, DEFINITIONS, AND ABBREVIATIONS

101 APPLICATIONS, DEFINITIONS, AND ABBREVIATIONS – DELETE this section in its entirety.

END OF SECTION

102 PROPOSAL REQUIREMENTS

102 PROPOSAL REQUIREMENTS – DELETE this section in its entirety.

END OF SECTION

103 AWARD AND EXECUTION OF CONTRACT

103 AWARD AND EXECUTION OF CONTRACT – DELETE this section in its entirety.

END OF SECTION

104 SCOPE OF WORK

104 SCOPE OF WORK – DELETE this section in its entirety.

END OF SECTION

105 CONTROL OF WORK

105 CONTROL OF WORK – DELETE this section in its entirety.

END OF SECTION

106 CONTROL OF MATERIALS

106 CONTROL OF MATERIALS – DELETE this section in its entirety.

END OF SECTION

107 LEGAL RELATIONS AND RESPONSIBILITIES

107 LEGAL RELATIONS AND RESPONSIBILITIES – DELETE this section in its entirety.

END OF SECTION

108 PROSECUTION AND PROGRESS OF WORK

Comply with 108 PROSECUTION AND PROGRESS OF WORK of the Standard Specifications modified as follows:

DELETE all subsections except for Subsection 108.06.00 LIQUIDATED DAMAGES.

END OF SECTION

109 MEASUREMENT AND PAYMENT

109 MEASUREMENT AND PAYMENT – DELETE this section in its entirety.

END OF SECTION

DIVISION 2 – GENERAL TECHNICAL REQUIREMENTS

201 MOBILIZATION

201 MOBILIZATION – DELETE this section in its entirety.

END OF SECTION

202 TEMPORARY TRAFFIC CONTROL

202 TEMPORARY TRAFFIC CONTROL – DELETE this section in its entirety.

END OF SECTION

203 CLEARING AND GRUBBING

Comply with 203 CLEARING AND GRUBBING of the Standard Specifications modified as follows:

203.03.00 CONSTRUCTION – After the third paragraph that begins “Mail boxes in the work area...” ADD the following:

“For demolition requirements, see Supplemental Specification Section 02 41 00, Demolition.”

203.02.00 MATERIALS – DELETE this subsection in its entirety.

203.04.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

204 EXCAVATION, BACKFILL, AND OTHER SITE WORK

Comply with 204 EXCAVATION, BACKFILL, AND OTHER SITE WORK of the Standard Specifications modified as follows:

204.02.07 EXPLOSIVES – DELETE this subsection in its entirety.

204.05.00 MEASUREMENT AND PAYMENT – DELETE this subsection it its entirety.

END OF SECTION

205 CONCRETE, ASPHALT, AND AGGREGATE MATERIALS

Comply with 205 CONCRETE, ASPHALT, AND AGGREGATE MATERIALS of the Standard Specifications modified as follows:

205.01.02D – ADMIXTURES – ADD the following at the end of subsection:

“COLOR PIGMENT

Concentrated pigments specially processed for mixing into concrete and complying with ASTM C979/C979M, inert, synthetic mineral or metaloxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

Manufacturer: Davis Colors, or approved equal.

Color: As indicated on Drawings.”

205.04.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

206 CONCRETE STRUCTURES

Comply with 206 CONCRETE STRUCTURES of the Standard Specifications modified as follows:

206.04.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

207 BORING AND JACKING

207 BORING AND JACKING – DELETE this subsection in its entirety.

END OF SECTION

208 RESURFACING

Comply with 208 RESURFACING of the Standard Specifications modified as follows:

208.04.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

209 CLEANUP AND SITE RESTORATION

Comply with 209 CLEANUP AND SITE RESTORATION of the Standard Specifications modified as follows:

209.03.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

210 STREET TREE STANDARDS

Comply with 210 STREET TREE STANDARDS of the Standard Specifications modified as follows:

210.01.00 APPLICATION OF STANDARDS – DELETE this subsection in its entirety.

210.02.00 STREET TREE SELECTION – DELETE this subsection in its entirety.

210.03.00 STREET TREE QUALITY AT TIME OF PLANTING – DELETE this subsection in its entirety.

210.04.00 STREET TREE SIZE AT TIME OF PLANTING – DELETE this subsection in its entirety.

210.05.00 STREET TREE CONDITION AT TIME OF PLANTING – DELETE this subsection in its entirety.

210.07.00 STREET TREE PLANTING PROCEDURES - DELETE all text and REPLACE with Supplemental Specification Section 32 93 00, Plants, for planting of all trees on the Project.

210.08.00 ESTABLISHMENT RESPONSIBILITIES – DELETE all text in Subsection 210.08.01 to 210.08.06 and REPLACE with Supplemental Specification Section 32 05 33, Landscape Establishment.

210.09.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

ADD the following section:

211 SITE FURNISHINGS

211.01.00 GENERAL

For site furnishings, see Supplemental Specification Section 12 93 00, Site Furnishings.

END OF SECTION

ADD the following section:

212 ELECTRICAL

212.01.00 GENERAL

For electrical, see Supplemental Specification Section 26 05 01, Electrical.

END OF SECTION

ADD the following section:

213 RETAINING WALL SYSTEMS

213.01.00 GENERAL

For Retaining Wall Systems, see Supplemental Specification Section 32 32 24, Gravity Block Wall System.

END OF SECTION

ADD the following section:

214 LANDSCAPING

214.01.00 GENERAL

For Landscaping, see Supplemental Specification Section 32 05 33, Landscape Establishment; Supplemental Specification Section 32 84 23, Landscape Irrigation Systems; Supplemental Specification Section 32 91 13, Soil Preparation; Supplemental Specification Section 32 92 00, Turf and Grasses; Supplemental Specification Section 32 93 00, Plants.

END OF SECTION

DIVISION 3 – STREETS

301 SUBGRADE

Comply with 301 SUBGRADE of the Standard Specifications modified as follows:

301.02.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

302 AGGREGATE BASES

Comply with 302 AGGREGATE BASES of the Standard Specifications modified as follows:

302.03.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

303 CEMENT TREATED BASE (CTB)

303 CEMENT TREATED BASE (CTB) – DELETE this section in its entirety.

END OF SECTION

304 ASPHALT CONCRETE PAVEMENT

Comply with 304 ASPHALT CONCRETE PAVEMENT of the Standard Specifications modified as follows:

304.03.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

305 PORTLAND CEMENT CONCRETE PAVEMENT

Comply with 305 PORTLAND CEMENT CONCRETE PAVEMENT of the Standard Specifications modified as follows:

305.01.00 MATERIALS - ADD the following subsection:

305.01.03 – COLOR ADDITIVES

Color pigment provided per Special Provision to Section 205 CONCRETE, ASPHALT, AND AGGREGATE MATERIALS.

305.02.03 MIXING - ADD the following paragraph at the end of the subsection:

“Color Pigment: Where required in supplement, add color pigment to concrete mixture according to manufacturer’s written instructions and to result in hardened concrete color consistent with approved sample as indicated on Drawings.”

305.03.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

**306 CURBS, GUTTERS, SIDEWALKS, DRIVEWAY APPROACHES,
AND ACCESS RAMPS**

Comply with 306 CURBS, GUTTERS, SIDEWALKS, DRIVEWAY APPROACHES, AND
ACCESS RAMPS of the Standard Specifications modified as follows:

306.03.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

307 PAVEMENT MARKINGS

Comply with 307 PAVEMENT MARKINGS of the Standard Specifications modified as follows:

307.03.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

DIVISION 4 – SANITARY SEWERS AND STORM DRAINS

Comply with 401 PIPE AND FITTINGS FOR SANITARY SEWERS AND STORM DRAINS of the Standard Specifications modified as follows:

401.01.02B CONCRETE PIPE – DELETE this subsection in its entirety.

401.01.02D STEEL AND ALUMINUM ALLOY PIPE – DELETE this subsection in its entirety.

401.01.02E SANITITE HP POLYPROPYLENE PIPE – DELETE this subsection in its entirety.

401.01.03A CONCRETE FITTINGS – DELETE this subsection in its entirety.

401.01.03D FITTINGS FOR STEEL AND ALUMINUM ALLOY PIPE – DELETE this subsection in its entirety.

401.01.03E FITTINGS FOR SANITITE HP POLYPROPYLENE PIPE – DELETE this subsection in its entirety.

401.01.04B CONCRETE PIPE – DELETE this subsection in its entirety.

401.01.04E STEEL AND ALUMINUM ALLOY PIPE – DELETE this subsection in its entirety.

401.01.04F SANITITE HP POLYPROPYLENE PIPE – DELETE this subsection in its entirety.

401.01.05C STEEL AND ALUMINUM ALLOY PIPE – DELETE this subsection in its entirety.

401.02.05A CONCRETE PIPE – DELETE this subsection in its entirety.

401.02.05C STEEL AND ALUMINUM ALLOY PIPE – DELETE this subsection in its entirety.

401.03.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

402 MANHOLES, INLETS, AND CATCH BASINS

Comply with 402 MANHOLES, INLETS, AND CATCH BASINS of the Standard Specifications modified as follows:

402.03.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

**403 WORK ON EXISTING SANITARY SEWERS
AND STORM DRAIN STRUCTURES**

Comply with 403 WORK ON EXISTING SANITARY SEWERS AND STORM DRAIN STRUCTURES of the Standard Specifications modified as follows:

403.03.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

DIVISION 5 – WATER

501 WATER PIPE AND FITTINGS

Comply with 501 WATER PIPE AND FITTINGS of the Standard Specifications modified as follows:

501.01.01A MECHANICAL JOINTS

“Nuts shall be provided with factory applied coating for corrosion protection.”

501.01.01A FLANGED JOINTS

“Bolts, nuts, and similar items shall be coated with bituminous or epoxy paint.”

501.01.02 RED-BRASS PIPE – DELETE this subsection in its entirety and REPLACE with the following:

501.01.02 HIGH-DENSITY POLYETHYLENE (HDPE) PRESSURE PIPE AND FITTINGS

“Refer to Supplemental Specification Section 33 05 01.10, High Density Polyethylene (HDPE) Pressure Pipe and Fittings for materials and construction of HDPE pipe and fittings.”

501.01.08 CATHODIC PROTECTION – ADD the following at the end of the subsection:

“Refer to Supplemental Specification Section 26 42 01, Pipe Bonding and Test Stations, and Section 26 42 02, Galvanic Anode Cathodic Protection System, for construction of cathodic protection.”

501.02.07 PIPE AND FITTING INSTALLATION – ADD the following subsection:

501.02.07F HIGH-DENSITY POLYETHYLENE (HDPE) PRESSURE PIPE AND FITTINGS

“Refer to Supplemental Specification Section 33 05 01.10, High Density Polyethylene (HDPE) Pressure Pipe and Fittings for construction of HDPE pipe and fittings.”

501.03.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

502 VALVES AND RELATED EQUIPMENT

Comply with 502 VALVES AND RELATED EQUIPMENT of the Standard Specifications modified as follows:

502.03.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

503 FIRE HYDRANTS

Comply with 503 FIRE HYDRANTS of the Standard Specifications modified as follows:

503.03.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

504 WATER SERVICE INSTALLATION

Comply with 504 WATER SERVICE INSTALLATION of the Standard Specifications modified as follows:

504.03.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

505 HYDROSTATIC PRESSURE/LEAKAGE TESTING AND DISINFECTION

Comply with 505 HYDROSTATIC PRESSURE/LEAKAGE TESTING AND DISINFECTION of the Standard Specifications modified as follows:

505.01.01 GENERAL – ADD the following to the end of the subsection:

Conduct pressure and leakage testing for HDPE pipe separately from other pipe materials. Refer to Section 33 05 01.10, High-Density Polyethylene (HDPE) Pressure Pipe and Fittings, for pressure and leakage testing requirements of HDPE pipe.

END OF SECTION

DIVISION 6 – POST-CONSTRUCTION STORMWATER QUALITY FACILITIES

601 GROWING MEDIUM

Comply with 601 GROWING MEDIUM of the Standard Specifications modified as follows:

601.04.00 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

602 AGGREGATES

Comply with 602 AGGREGATES of the Standard Specifications modified as follows:

602.01.03 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

602.02.03 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

602.03.03 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

603 STRUCTURAL COMPONENTS

Comply with 603 STRUCTURAL COMPONENTS of the Standard Specifications modified as follows:

603.01.02 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

603.02.04 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

603.03.02 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

603.04.03 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

603.05.01 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

603.06.01 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

603.07.02 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

604 SURFACE TREATMENTS

Comply with 604 SURFACE TREATMENTS of the Standard Specifications modified as follows:

604.01.03 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

604.02.03 MEASUREMENT AND PAYMENT – DELETE this subsection in its entirety.

END OF SECTION

605 VEGETATION

Comply with 605 VEGETATION of the standard specification modified as follows:

605 VEGETATION – DELETE this Section in its entirety and REPLACE with Supplemental Specification Section 32 93 00, Plants, and Supplemental Specification Section 32 05 33, Landscape Establishment.

END OF SECTION

**SUPPLEMENTAL
SPECIFICATIONS**

SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. Air-Conditioning, Heating, and Refrigeration Institute (AHRI): Guideline K, Containers for Recovered Non-flammable Fluorocarbon Refrigerants.
 2. American National Standards Institute (ANSI): A10.6, Safety Requirements for Demolition Operations.
 3. Environmental Protection Agency (EPA), U.S. Code of Federal Regulations (CFR), Title 40:
 - a. Part 61—National Emission Standards for Hazardous Air Pollutants.
 - b. Part 82—Protection of Stratospheric Ozone.
 - c. Part 273—Standards for Universal Waste Management.
 4. Occupational Safety and Health Administration (OSHA), U.S. Code of Federal Regulations (CFR) Title 29 Part 1926—Occupational Safety and Health Regulations for Construction.

1.02 DEFINITIONS

- A. ACM: Asbestos-containing material.
- B. Demolition: Dismantling, razing, destroying, or wrecking of any fixed building or structure or any part thereof. Demolition also includes removal of pipes, manholes tanks, conduit, and other underground facilities, whether as a separate activity or in conjunction with construction of new facilities.
- C. Modify: Provide all necessary material and labor to modify an existing item to the condition indicated or specified.
- D. Relocate: Remove, protect, clean and reinstall equipment, including electrical, instrumentation, and all ancillary components required to make the equipment fully functional, to the new location identified on Drawings.
- E. Renovation: Altering a facility or one or more facility components in any way.

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- F. Salvage/Salvageable: Remove and deliver, to the specified location(s), the equipment, building materials, or other items so identified to be saved from destruction, damage, or waste; such property to remain that of Owner. Unless otherwise specified, title to items identified for demolition shall revert to Contractor.
- G. Universal Waste Lamp: In accordance with 40 CFR 273, the bulb or tube portion of an electric lighting device, examples of which include, but are not limited to, fluorescent, high-intensity discharge, neon, mercury vapor, high-pressure sodium, and metal halide lamps.
- H. Universal Waste Thermostat: A temperature control device that contains metallic mercury in an ampule attached to a bimetal sensing element, and mercury-containing ampules that have been removed from these temperature control devices in compliance with the requirements of 40 CFR 273.

1.03 SUBMITTALS

- A. Informational Submittals:
 - 1. Submit proposed Demolition/Renovation Plan, in accordance with requirements specified herein, for approval before such Work is started.
 - 2. Submit copies of any notifications, authorizations and permits required to perform the Work.
 - 3. Copies of reports and other documentation required for abandoning wells.
 - 4. Submit a shipping receipt or bill of lading for all containers of ACM shipped.
 - 5. Submit a shipping receipt or bill of lading for all universal waste shipped.

1.04 REGULATORY AND SAFETY REQUIREMENTS

- A. When applicable, demolition Work shall be accomplished in strict accordance with 29 CFR 1926-Subpart T.
- B. Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the General Conditions, Contractor's safety requirements shall conform to ANSI A10.6.
- C. Furnish timely notification of this demolition project to applicable federal, state, regional, and local authorities in accordance with 40 CFR 61-Subpart M.

1.05 DEMOLITION PLAN

- A. Demolition Plan shall provide for safe conduct of the Work and shall include:
1. Detailed description of methods and equipment to be used for each operation.
 2. The Contractor's planned sequence of operations, including coordination with other work in progress.
 3. Disconnection schedule of utility services.

1.06 SEQUENCING AND SCHEDULING

- A. The Work of this Specification shall not commence until Contractor's Demolition/Renovation Plan has been approved by Engineer.
- B. Include the Work of this Specification in the progress schedule, as specified in Section 01 32 00, Construction Progress Documentation.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EXISTING FACILITIES TO BE DEMOLISHED OR RENOVATED

- A. Utilities and Related Equipment:
1. Notify Owner of appropriate utilities to turn off affected services at least 48 hours before starting demolition activities.
 2. Remove existing utilities as indicated and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by Engineer.
 3. When utility lines are encountered that are not indicated on Drawings, notify Engineer prior to further work in that area.
 4. Remove meters and related equipment and deliver to a location as determined by the Owner.
 5. Provide a permanent leak-proof closure for water and gas lines.
- B. Paving and Slabs:
1. Remove concrete and asphaltic concrete paving and slabs including aggregate base completely.
 2. Provide neat sawcuts at limits of pavement removal as indicated.

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C. Piping:

1. Field verify condition of piping prior to demolition.
2. Clean, flush, and purge piping of any fluids prior to demolition. Coordinate the management of any residuals remaining in piping with Owner. Neutralize flush water (as needed) prior to disposal.
3. Ensure that connected mains, branches, or other lines are properly isolated, plugged, or transferred prior to piping demolition.
4. Plug and cap piping at demolition extents shown on Drawings.
5. Extend plugs made of nonshrink grout into the pipe 24 inches minimum to form a solid waterproof plug completely bonded to the pipe.
6. Install concrete around plug and over pipe to ensure a waterproof plug when manufactured plugs are used.
7. Pipe Abandonment: Regardless of size, abandon in-place buried piping and piping located under structures, and completely fill with controlled density fill (CDF), unless noted otherwise on Drawings.

D. Electrical:

1. Cut off concealed or embedded conduit, boxes, or other materials a minimum of 3/4 inch below final finished surface.
2. When removing designated equipment, conduit and wiring may require rework to maintain service to other equipment.
3. Rework existing circuits, or provide temporary circuits as necessary during renovation to maintain service to existing lighting and equipment not scheduled to be renovated. Existing equipment and circuiting shown are based upon limited field surveys. Verify existing conditions, make all necessary adjustments, and record the Work on the Record Drawings. This shall include, but is not limited to, swapping and other adjustments to branch circuits and relocation of branch circuit breakers within panelboards as required to accomplish the finished work.
4. Reuse of existing luminaires, devices, conduits, boxes, or equipment will be permitted only where specifically indicated.
5. Raceways and cabling not scheduled for reuse.
6. Inaccessibly Concealed: Cut off and abandon in place.
7. Exposed or Concealed Above Accessible Ceilings: Remove.
8. Raceways and Cabling Scheduled for Future Use: Cap/seal and tag.
9. Relocating Equipment: Extend existing wiring or run new wiring from the source.
10. Where the existing raceway is concealed, the outlet box shall be cleaned, and a blank cover plate installed.
11. Where the concealed raceway is uncovered remove raceway (or extended to new location if appropriate).
12. Provide new typewritten panelboard circuit directory cards.

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- E. Universal Waste Lamps and Thermostats: Manage, contain, package, and label in strict accordance with 40 CFR 273.
- F. Drawings show the location of known existing structures, utilities, and facilities. The information on exposed and buried objects has been obtained from field investigations, observations, and available record drawings and shown as a screened background. The information is not guaranteed to be either complete or accurate and must be verified by the Contractor via potholing and hand excavation, and field measurements as required prior to starting demolition work. After encountering changes to the conditions shown on Drawings, the Contractor shall include field verified measurements and as-built documentation with the required submittals defined under Article Demolition Plan.
- G. Prior to performing any demolition work on the existing utilities or facilities, the Contractor shall coordinate all efforts with Owner to define details, and schedules of temporary shutdowns of existing utilities or facilities, or maintenance of continuous service operation.

3.02 PROTECTION

- A. Dust and Debris Control:
 - 1. Prevent the spread of dust and debris to avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution.
 - 2. Vacuum and dust the Work area as needed.
 - 3. Sweep pavements as often as necessary to control the spread of debris that may result in foreign object damage potential to vehicular traffic.
- B. Traffic Control Signs: Where pedestrian and driver safety is endangered in the area of removal Work, use traffic barricades with flashing lights.
- C. Existing Work:
 - 1. Survey the Site and examine Drawings and Specifications to determine the extent of the Work before beginning any demolition or renovation.
 - 2. Take necessary precautions to avoid damage to existing items scheduled to remain in place, to be reused, or to remain the property of Owner; any Contractor-damaged items shall be repaired or replaced as directed by Engineer.

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3. Provide temporary weather protection during interval between removal of existing exterior surfaces and installation of new to ensure that no water leakage or damage occurs to structure or interior areas of existing building.
 4. Ensure that structural elements are not overloaded as a result of or during performance of the Work. Responsibility for additional structural elements or increasing the strength of existing structural elements as may be required as a result of any Work performed under this Contract shall be that of the Contractor. Repairs, reinforcement, or structural replacement must have Engineer approval.
 5. Do not overload pavements to remain.
- D. Trees: Protect trees within the Site that might be damaged during demolition and are indicated to be left in place, by a 6-foot-high fence. The fence shall be securely erected a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Any tree designated to remain that is damaged during the Work shall be replaced in kind, as approved by the Engineer.
- E. Facilities:
1. Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities.
 2. Floors, roofs, walls, columns, pilasters, and other structural elements that are designed and constructed to stand without lateral support or shoring, and are determined by Contractor to be in stable condition, shall remain standing without additional bracing, shoring, or lateral support until demolished, unless directed otherwise by the Engineer.
 3. Protect all facility elements not scheduled for demolition.
 4. Provide interior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent facilities.
- F. Protection of Personnel:
1. During demolition, continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site.
 2. Provide temporary barricades and other forms of protection to protect Owner's personnel and the general public from injury due to demolition Work.

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3. Provide protective measures as required to provide free and safe passage of Owner's personnel and the general public to occupied portions of the structure.

3.03 BURNING

- A. The use of burning at the Site for the disposal of refuse and debris will not be permitted.

3.04 RELOCATIONS

- A. Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Clean all items to be relocated prior to reinstallation, to the satisfaction of Engineer. Repair items to be relocated which are damaged or replace damaged items with new undamaged items as approved by Engineer.

3.05 BACKFILL

- A. Do not use demolition debris as backfill material.
- B. Fill excavations, open basements and other hazardous openings to existing ground level or foundation level of new construction in accordance with Division 204 of the City of Albany, Standard Specifications.

3.06 DISPOSITION OF MATERIAL

- A. Do not remove equipment and materials without approval of Contractor's Demolition Plan by Engineer.

3.07 REUSE OF MATERIALS AND EQUIPMENT

- A. Remove and store materials and equipment to be relocated to a temporary, secure location to prevent damage, and reinstall as the Work progresses.
- B. Properly store and maintain equipment and materials in same condition as when removed.
- C. Equipment and material designated to be relocated shall be cleaned, serviced and checked for proper operability before being put back into service.

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3.08 UNSALVAGEABLE MATERIAL

- A. Concrete, masonry, and other material, except concrete permitted to remain in place, shall be disposed of offsite.
- B. Universal Waste Lamps and Thermostats: Dispose of in strict accordance with 40 CFR 273.

3.09 CLEANUP

- A. Debris and rubbish shall be removed from basement and similar excavations. Debris and rubbish shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

END OF SECTION

**SECTION 12 93 00
SITE FURNISHINGS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Retractable Bollards.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:

1. ASTM Testing Standards:
 - a. ASTM A36, Standard Specification for Carbon Structural Steel.
 - b. ASTM A312, Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
 - c. ASTM A536, Ductile Iron.
 - d. ASTM A500, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - e. ASTM A1011, Hot rolled pickled and oiled steel.
 - f. ASTM B26, Standard Specification for Aluminum-Alloy Sand Castings.
 - g. ASTM B117, Standard Practice for Operating Salt Spray (Fog) Apparatus.
 - h. ASTM D522, Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
 - i. ASTM D523, Standard Test Method for Specular Gloss.
 - j. ASTM D2247, Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
 - k. ASTM D2794, Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
 - l. ASTM D3359, Standard Test Methods for Measuring Adhesion by Tape Test.
 - m. ASTM D3363, Standard Test Method for Film Hardness by Pencil Test.
 - n. ASTM G155, Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.
2. ISO Testing Standards:
 - a. ISO 1520, Paints and Varnishes – Cupping Test.
 - b. ISO 2815, Paints and Varnishes – Buchholz Indentation Test.
3. LFI Testing Standards: LFI PT-019, Standard Test for Strength and Durability.

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1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, storage and handling requirements and recommendations, installation methods and available colors, styles, patterns and textures.
- B. Manufacturer's installation instructions.
- C. Warranty: Manufacturer's standard warranty.
- D. Maintenance Data: Submit manufacturer's field touch-up, cleaning, and maintenance instructions.

1.04 QUALITY ASSURANCE

- A. Comply with Manufacturer's recommendations.
- B. Manufacturers' directions and the Drawings shall be followed in all cases where the manufacturers of articles used in this Contract furnish directions covering points not shown on the Drawings and Specifications.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Handle products in accordance with manufacturer's instructions.
- B. Store products in manufacturer's original packaging until ready for installation.
- C. Protect products from impacts and abrasion during storage.

1.06 WARRANTY

- A. Provide manufacturer's standard warranty.
 - 1. Warranty Terms: 1 year from date of invoice against defects in materials and workmanship.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Reliance Foundry Co. Ltd, "or-equal."
 - 1. Telephone: (604) 547-0460 or (877) 789-3245.
 - 2. Fax: (604) 590-8875.

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3. Website: <https://www.reliance-foundry.com/bollard>
4. Email: info@reliance-foundry.com

B. Retractable Bollard Set:

1. Material: Coated Stainless Steel.
 - a. Pipe: ASTM A312, Grade TP 316.
 - b. Plate: ASTM A959, Grade TP 316.
2. Country of Origin: China.
3. Bollard:
 - a. Model: Reliance Foundry; r-8471-ra.
 - b. Height: 35-1/2 inches (90.2 cm).
 - c. Diameter: 4-1/2 inches (11.4 cm).
 - d. Weight: 25 pounds (11.3 kg).
 - e. Design: Retractable cylinder with flat top.
 - f. Lock: Extended only.
 - g. Color Coating:
 - 1) Type: Polyester powder coat over epoxy primer with IronArmor finish.
 - 2) Color: Black.
 - 3) Reflective Stripe: White.
4. Installation:
 - a. Retractable, New Concrete:
 - 1) Receiver.
 - 2) Locking: In raised position.
 - 3) Footing: 3,000 psi minimum concrete or mortar.
 - 4) Fill: Aggregate.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrates are stable and capable of supporting the weight of items covered under this section.
- B. Verify that substrates have been adequately prepared to securely anchor those items that will be surface mounted.
- C. Notify project engineer of conditions that would adversely affect installation or subsequent use.
- D. Do not begin installation until unacceptable conditions are corrected.

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3.02 INSTALLATION

- A. General: Comply with manufacturer's installation instructions and setting drawings.
- B. Do not install damaged, cracked, chipped, deformed or marred bollards. Field touch-up minor imperfections in accordance with manufacturer's instructions. Replace bollards that cannot be field repaired.
- C. Install level and plumb according to the manufacturer's installation instructions.
- D. Anchor item securely in place per manufacturer's recommendations, if required.
- E. Install in conformance to applicable ADA guidelines and End User's established Accessibility policies.
- F. Field verify all dimensions and conditions affecting the Work.
- G. All work shall be left clean and free from warp, twist, open joints and other defects.
- H. Protect installed work during remaining construction operations. Repair marred or damaged finishes matching adjacent surfaces or replace with new matching materials.

3.03 CLEANING

- A. Clean item promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that could damage finish.

3.04 PROTECTION

- A. Protect installed item to ensure that, except for normal weathering, item will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 26 05 01
ELECTRICAL

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Association of State Highway Transportation Officials (AASHTO).
 2. ASTM International (ASTM):
 - a. A193, Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
 - b. A240/A240M, Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels.
 - c. A1011/A1011M, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - d. B8, Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
 - e. C857, Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
 3. Electronic Industries Association (EIA/TIA): 569, Commercial Building Standard for Telecommunications Pathways and Spaces.
 4. Federal Specifications (FS):
 - a. W-C-596, Connector, Electrical, Power, General Specification for.
 - b. W-S-896, Switch, Toggle (Toggle and Lock), Flush Mounted (General Specification).
 5. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
 - a. C62.41, Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
 - b. PC62.41.1, Draft Guide on the Surge Environment in Low-Voltage (1,000 V and less) AC Power Circuits.
 - c. 114, IEEE Standard Test Procedure for Single-Phase Induction Motors.
 6. International Electrical Testing Association (NETA): ATS, Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
 7. National Electrical Contractor's Association, Inc. (NECA): 1, Standard Practices for Good Workmanship in Electrical Contracting.

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8. National Electrical Manufacturers Association (NEMA):
 - a. C80.1, Rigid Steel Conduit-Zinc Coated.
 - b. 250, Enclosures for Electrical Equipment (1,000 Volts Maximum).
 - c. ICS 1, Industrial Control and Systems: General Requirements.
 - d. ICS 2, Industrial Control and Systems: Controllers, Contactors, and Overload Relays Rated Not More Than 2,000V ac or 750V dc.
 - e. ICS 2.3, Industrial Control and Systems: Instructions for the Handling, Installation, Operation and Maintenance of Motor Control Centers.
 - f. PB 1, Panelboards.
 - g. RN 1, Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
 - h. TC 2, Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
 - i. TC 3, PVC Fittings for Use with Rigid PVC Conduit and Tubing.
 - j. WC 55, Instrumentation Cables and Thermocouple Wire.
 - k. WC 70, Standard for Non-Shielded Power Cables Rated 2,000 V or Less for the Distribution of Electrical Energy.
 - l. WD 1, General Color Requirements for Wiring Devices.
9. National Fire Protection Association (NFPA): 70, National Electrical Code (NEC).
10. UL:
 - a. 6, Electrical Rigid Metal Conduit—Steel.
 - b. 44, Thermoset Insulated Wires and Cables.
 - c. 67, Panelboards.
 - d. 98, Enclosed and Dead-Front Switches.
 - e. 198C, High Interrupting Capacity Fuses, Current Limiting Types.
 - f. 198E, Class R Fuses.
 - g. 360, Liquid-Tight Flexible Steel Conduit.
 - h. 486A, Wire Connectors and Soldering Lugs for Use with Copper Conductors.
 - i. 486C, Splicing Wire Connectors.
 - j. 489, Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit Breaker Enclosures.
 - k. 508, Industrial Control Equipment.
 - l. 510, Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape.
 - m. 514B, Fittings for Cable and Conduit.
 - n. 651, Schedule 40 and 80 PVC Conduit.
 - o. 854, Service-Entrance Cables.
 - p. 870, Wireways, Auxiliary Gutters, and Associated Fittings.
 - q. 943, Ground-Fault Circuit Interrupters.
 - r. 1059, Terminal Blocks.

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- s. 1277, Electrical Power and Control Tray Cables with Optional Optical-Fiber Members.
- t. 1449, Surge Suppression Devices.

1.02 DEFINITIONS

- A. AHJ: Authority Having Jurisdiction.
- B. MCOV: Maximum Allowable Continuous Operating Voltage.
- C. MOV: Metal Oxide Varistor.
- D. SASD: Silicon Avalanche Suppressor Diode.
- E. SPD: Surge Protective Device.
- F. SVR: Surge Voltage Rating.

1.03 SUBMITTALS

- A. Action Submittals:
 - 1. Service entrance and metering equipment.
 - 2. Boxes and device plates.
 - 3. Junction and pullboxes.
 - 4. Precast handholes.
 - 5. Wiring devices.
 - 6. Panelboards.
 - 7. Circuit breakers and switches.
 - 8. Control devices, terminal blocks, and relays.
 - 9. Contactors.
 - 10. Support and framing channels.
 - 11. Nameplates and nameplate schedule.
 - 12. SPD equipment.
 - 13. Conduit, fittings, and accessories.
 - 14. Wireways.
 - 15. Conductors, cable, and accessories.
 - 16. Luminaires.
 - 17. Lighting controls.

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B. Informational Submittals:

1. Seismic anchorage and bracing calculations as required by Section 01 88 15, Anchorage and Bracing.
2. Component and attachment testing seismic certificate of compliance as required by Section 01 45 33, Special Inspection, Observation, and Testing.
3. Factory test reports.
4. Field test reports.
5. Signed permits indicating Work is acceptable to regulatory authorities having jurisdiction.
6. Operation and Maintenance Data:
 - a. Provide for all equipment, as well as each device having features that can require adjustment, configuration, or maintenance.
 - b. Minimum information shall include manufacturer's preprinted instruction manual, one copy of the approved submittal information for the item, tabulation of any settings, and copies of any test reports.
 - c. Content for each item of equipment and each system, as appropriate:
 - 1) Warnings, cautions, and notes.
 - 2) Electrical Safety: General warnings.
 - 3) Compliance with Regulations: UL.
 - d. Description of Unit and Component Parts:
 - 1) Technical data and current ratings.
 - 2) Complete nomenclature, model number, and serial number (if applicable) or other pertinent data required to order all replaceable parts.
 - e. Electrical installations and wiring instructions.
 - f. Operation Procedures:
 - 1) Isolation and de-energizing procedures.
 - 2) Maintenance guidelines.
 - 3) Routine maintenance.
 - g. Servicing Schedule:
 - 1) Spare Parts: Predicted life of equipment subject to wear.
 - 2) List of original manufacture's recommended spare parts.
 - h. Copy of Warranty, bond and service contract issued. Provide an information sheet for Owner's personnel stating:
 - 1) The explicit expiration date of the warranty.
 - 2) Any instances or conditions which might affect the validity of warranties or bonds.

1.04 APPROVAL BY AUTHORITY HAVING JURISDICTION

- A. Provide the Work in accordance with NFPA 70, National Electrical Code (NEC). Where required by the Authority Having Jurisdiction (AHJ), material and equipment shall be labeled or listed by a nationally recognized testing laboratory or other organization acceptable to the AHJ, in order to provide a basis for approval under the NEC.
- B. Materials and equipment manufactured within the scope of standards published by UL, shall conform to those standards and shall have an applied UL listing mark or label.

1.05 QUALIFICATIONS

- A. PVC-Coated, Rigid Steel Conduit Installer: Must be certified by conduit manufacturer as having received minimum 2 hours of training on installation procedures.

PART 2 PRODUCTS

2.01 GENERAL

- A. Products shall comply with all applicable provisions of NFPA 70.
- B. Like Items of Equipment: End products of one manufacturer in order to achieve standardization for appearance, operation, maintenance, spare parts, and manufacturer's service.
- C. Equipment and Devices Installed Outdoors or in Unheated Enclosures: Capable of continuous operation within ambient temperature range of 30 degrees F to 110 degrees F.
- D. Hazardous Areas: Products shall be acceptable to the regulatory authority having jurisdiction for the class, division, and group of hazardous area indicated.
- E. Equipment Finish:
 - 1. Manufacturer's standard finish color, except where specific color is indicated.
 - 2. If manufacturer has no standard color, finish equipment in accordance with light gray color finish as approved by Engineer.

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2.02 SERVICE ENTRANCE EQUIPMENT AND METERING

- A. Equipment, installation arrangement, and scope of work shall be provided in accordance with requirements of the local electric utility.

2.03 OUTLET AND DEVICE BOXES

- A. Sheet Steel: One-piece drawn type, zinc- or cadmium-plated.
- B. Cast Metal:
 - 1. Box: Cast ferrous metal.
 - 2. Cover: Gasketed, weatherproof, and cast ferrous metal with stainless steel screws.
 - 3. Hubs: Threaded.
 - 4. Lugs: Cast Mounting.
 - 5. Manufacturers and Products, Nonhazardous Locations:
 - a. Crouse-Hinds; Type FS or FD.
 - b. Appleton; Type FS or FD.
- C. PVC-Coated Cast Metal:
 - 1. Type: One-piece.
 - 2. Material: Malleable iron, cast ferrous metal, or cast aluminum.
 - 3. Coating:
 - a. All Exterior Surfaces; 40 mils PVC.
 - b. All Interior Surfaces, 2 mils urethane.
 - 4. Manufacturers:
 - a. Robroy Industries.
 - b. Ocal.

2.04 JUNCTION AND PULL BOXES

- A. Outlet Boxes Used as Junction or Pull Box: As specified under Article Outlet and Device Boxes.
- B. Conduit Bodies Used as Junction Boxes: As specified under Article Conduit and Fittings.
- C. Large Sheet Steel Box:
 - 1. NEMA 250, Type 1.
 - 2. Box: Code-gauge, galvanized steel.
 - 3. Cover: Full access, screw type.
 - 4. Machine Screws: Corrosion-resistant.

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D. Large Cast Metal Box:

1. NEMA 250, Type 4.
2. Box: Cast ferrous metal, electrogalvanized finished, with drilled and tapped conduit entrances and exterior mounting lugs.
3. Cover: Hinged with screws.
4. Gasket: Neoprene.
5. Hardware and Machine Screws: ASTM A167, Type 316 stainless steel.
6. Manufacturers and Products, Surface Mounted Nonhinged Type:
 - a. Crouse-Hinds; Series W.
 - b. O-Z/Gedney; Series Y.
7. Manufacturer and Product, Surface Mounted, Hinged Type:
O-Z/Gedney; Series YW.
8. Manufacturers and Products, Recessed Type:
 - a. Crouse-Hinds; Type WJBF.
 - b. O-Z/Gedney; Series YR.

E. Concrete Box, Nontraffic Areas:

1. Box: Reinforced, cast concrete with extension.
2. Cover: Steel diamond plate with locking bolts.
3. Cover Marking: ELECTRICAL, TELEPHONE, or as shown.
4. Size: 10 inch by 17 inch (minimum).
5. Manufacturer and Product: Utility Vault Co.; Series 36-1017PB, with cover DP.

2.05 PRECAST HANDHOLES

A. Construction: Precast concrete.

B. Loading: AASHTO H-10, as noted below, in accordance with ASTM C857.

C. Drainage:

1. Slope floors toward drain points leaving no pockets or other nondraining areas.
2. Provide drainage outlet at low point of floor.

D. Raceway Entrances: Provide knockout panels on all four sides.

E. Handhole Frames and Covers:

1. Material: Steel, hot-dipped galvanized.
2. Cover Type: Solid, bolt-on or hinged, of checkered design, as noted below.

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3. Cover Loading: As noted below.
 4. Cover Designation: Lettering minimum 2 inches in height, as shown.
- F. Hardware: Steel, hot-dip galvanized.
- G. Furnish knockout for ground rod in each handhole.
- H. Manufacturers and Products: Utility Vault Company.
1. Small: H-10 incidental traffic loading; Model 2436 with CA2435Acover.
 2. Large: H-20 off-street traffic loading; Model 444 with matching cover.

2.06 WIRING DEVICES

- A. Receptacle, Ground Fault Circuit Interrupter:
1. Duplex, listed Class A to UL Standard 943, tripping at 5 mA.
 2. Color: Brown.
 3. Rating: 125 volts, NEMA WD 1, Configuration 5-20R, 20 amps.
 4. Size: For 2-inch by 4-inch outlet boxes.
 5. Standard Model: NEMA WD 1, with screw terminals and provisions for testing.
 6. Feed-Through Model: NEMA WD 1, with feed-through screw terminals and provisions for testing.
 7. Impact resistant nylon face.
 8. Manufacturers:
 - a. Bryant.
 - b. Hubbell.
 - c. Leviton.

2.07 DEVICE PLATES

- A. General: Sectional type plates not permitted.
- B. Engraved:
1. Character Height: 1/8 inch.
 2. Filler: Black.
- C. Weatherproof:
1. For Receptacles, Damp Locations:
 - a. Gasketed, cast-aluminum, with individual cap over each receptacle opening.

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- b. Mounting Screw and Cap Spring: Stainless steel.
- c. Manufacturers and Products:
 - 1) Crouse-Hinds; Type WLRD-1.
 - 2) Appleton; Type FSK-WRD.
- 2. For Receptacles, Wet Locations:
 - a. Impact-resistant, nonmetallic, single-gang, horizontal-mounting, providing, while in-use, NEMA 3R rating.
 - b. Stainless steel mounting and hinge hardware.
 - c. Lockable, paintable.
 - d. Color: Gray.
 - e. Manufacturers:
 - 1) Carlon.
 - 2) Leviton.

2.08 LIGHTING AND POWER DISTRIBUTION PANELBOARD

- A. NEMA PB 1, NFPA 70, and UL 67.
- B. Panelboards and Circuit Breakers: Suitable for use with 75 degrees C wire at full NFPA 70, 75 degrees C ampacity.
- C. Short-Circuit Current Equipment Rating: Fully rated; series connected unacceptable.
- D. Rating: Applicable to a system with available short-circuit current of 10,000 amperes rms symmetrical 120/240 volts.
- E. Cabinet:
 - 1. NEMA 250, Type 3R.
 - 2. Material: Code-gauge, hot-dip galvanized sheet steel with reinforced steel frame.
 - 3. Wiring Gutter: Minimum 4-inch square; both sides, top and bottom.
 - 4. Front: Fastened with adjustable clamps.
 - a. Trim Size: As required by mounting.
 - b. Finish: Manufacturer's standard.
 - 5. Door Hinges: Concealed.
 - 6. Locking Device:
 - a. Flush type.
 - b. Doors Over 30 Inches in Height: Multipoint.
 - c. Identical keylocks, with two milled keys each lock.
 - 7. Circuit Directory: Metal frame with transparent plastic face and enclosed card on interior of door.

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F. Bus Bar:

1. Material: Copper full sized throughout length.
2. Neutral: Insulated, rated same as phase bus bars with at least one terminal screw for each branch circuit.
3. Ground: Copper, installed on panelboard frame, bonded to box with at least one terminal screw for each circuit.
4. Lugs and Connection Points:
 - a. Suitable for either copper or aluminum conductors.
 - b. Solderless main lugs for main, neutral, and ground bus bars.
 - c. Subfeed or through-feed lugs as shown.

G. Circuit Breakers:

1. UL 489.
2. Thermal-magnetic, quick-make, quick-break, molded case, of indicating type showing ON/OFF and TRIPPED positions of operating handle.
3. Type: Bolt-on circuit breakers in all panelboards.
4. Multipole circuit breakers designed to automatically open all poles when an overload occurs on one pole.
5. Do not use tandem or dual circuit breakers in normal single-pole spaces.
6. Ground Fault Circuit Interrupter (GFCI): UL Class A GFCI, 5 mA trip, and 10,000 amps interrupting capacity circuit breakers.

H. Manufacturers:

1. Eaton.
2. Square D Co.
3. Siemens.

I. Panelboard SPD:

1. Provide SPD meeting IEEE C62.41.1 and IEEE C62.41.2 location in accordance with Category B.
2. Surge Current Capacity:
 - a. Distribution: 120 kA per phase; 60 kA per mode.
 - b. Branch: 80 kA per phase; 40 kA per mode
3. Maximum Continuous Operating Voltage (MCOV): Not less than 125 percent of the nominal system voltage.
4. Nominal Discharge Current (IN): 10 kA.

2.09 CIRCUIT BREAKER, INDIVIDUAL, 0 TO 600 VOLTS

- A. UL 489 listed for use at location of installation.
- B. Minimum Interrupt Rating: As shown.
- C. Thermal-magnetic, quick-make, quick-break, indicating type showing ON/OFF and TRIPPED indicating positions of operating handle.
- D. Suitable for use with 75 degrees C wire at full NFPA 70, 75 degrees C ampacity.
- E. Locking: Provisions for padlocking handle.
- F. Enclosure: As specified under Execution.
- G. Interlock: Enclosure and switch shall interlock to prevent opening cover with breaker in the ON position.
- H. Manufacturers:
 - 1. Eaton.
 - 2. General Electric Co.
 - 3. Square D Co.

2.10 TERMINAL BLOCKS

- A. Type: UL 1059. Compression screw clamp, with current bar providing direct contact with wire and yoke, with individual rail mounted terminals. Marking system shall permit use of preprinted or field-marked tags.
- B. Yokes and Clamping Screws: Zinc-plated, hardened steel.
- C. Rating: 600V ac.
- D. Manufacturers:
 - 1. Weidmuller, Inc.
 - 2. Ideal.

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2.11 SUPPORT AND FRAMING CHANNELS

- A. Carbon Steel Framing Channel:
 - 1. Material: Rolled, mild strip steel, 12 gauge, ASTM A1011/A1011M, Grade 33.
 - 2. Finish: Hot-dip galvanized after fabrication.
- B. Stainless Steel Framing Channel: Rolled, ASTM A167, Type 316 stainless steel, 12 gauge.
- C. Manufacturers:
 - 1. B-Line Systems, Inc.
 - 2. Unistrut Corp.

2.12 NAMEPLATES

- A. Material: Laminated plastic.
- B. Attachment: Adhesive.
- C. Color: Black, engraved to a white core, or as shown.
- D. Engraving:
 - 1. Devices and Equipment: Name or tag shown, or as required.
 - 2. Panelboards:
 - a. Designation.
 - b. Service voltage.
 - c. Phases.
 - 3. Minimum Requirement: Label metering and power distribution equipment, local control panels, junction boxes, motor controls, and transformers.
- E. Letter Height:
 - 1. Pushbuttons, Selector Switches, and Other Devices: 1/8 inch.
 - 2. Equipment and Panelboards: 1/4 inch.

2.13 CONDUIT AND FITTINGS

- A. Rigid Galvanized Steel Conduit (RGS):
 - 1. Meet requirements of NEMA C80.1 and UL 6.
 - 2. Material: Hot-dip galvanized, with chromated protective layer.

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B. PVC Schedule 40 Conduit:

1. Meet requirements of NEMA TC 2 and UL 651.
2. UL listed for concrete encasement, underground direct burial, concealed, or direct sunlight exposure, and 90 degrees C insulated conductors.

C. PVC Schedule 80 Conduit:

1. Meet requirements of NEMA TC 2 and UL 651.
2. UL listed for concrete encasement, underground direct burial, concealed or direct sunlight exposure, and 90 degrees C insulated conductors.

D. PVC-Coated Rigid Galvanized Steel Conduit:

1. Meet requirements of NEMA RN 1.
2. Material:
 - a. Meet requirements of NEMA C80.1 and UL 6.
 - b. Exterior Finish: PVC coating, 40 mils nominal thickness, bond to metal shall have tensile strength greater than PVC.
 - c. Interior finish: Urethane coating, 2 mils nominal thickness.
3. Threads: Hot-dipped galvanized and factory coated with urethane.
4. Bendable without damage to either interior or exterior coating.

E. Fittings:

1. Provide bushings, grounding bushings, conduit hubs, conduit bodies, couplings, unions, conduit sealing fittings, drain seals, drain/breather fittings, expansion fittings, and cable sealing fittings, as applicable.
2. Rigid Galvanized Steel and Intermediate Metal Conduit:
 - a. Meet requirements of UL 514B.
 - b. Type: Threaded, galvanized.
3. PVC Conduit:
 - a. Meet requirements of NEMA TC 3.
 - b. Type: PVC, slip-on.
4. PVC-Coated Rigid Galvanized Steel Conduit:
 - a. Meet requirements of UL 514B.
 - b. Fittings: Rigid galvanized steel type, PVC-coated by conduit manufacturer.
 - c. Conduit Bodies: Cast metal hot-dipped galvanized or urethane finish. Cover shall be of same material as conduit body. PVC-coated by conduit manufacturer.
 - d. Finish: 40-mil PVC exterior, 2-mil urethane interior.

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- e. Overlapping pressure sealing sleeves.
- f. Conduit Hangers, Attachments, and Accessories: PVC-coated.
- g. Manufacturers:
 - 1) Robroy Industries.
 - 2) Ocal.
- h. Expansion Fitting Manufacturer and Product: Ocal;
Ocal-Blue XJG.

2.14 CONDUIT ACCESSORIES

A. Identification Devices:

- 1. Raceway Tags:
 - a. Material: Permanent, nonferrous metal.
 - b. Shape: Round.
 - c. Raceway Designation: Pressure stamped, embossed, or engraved.
 - d. Tags relying on adhesives or taped-on markers not permitted.
- 2. Warning Tape:
 - a. Material: Polyethylene, 4-mil gauge with detectable strip.
 - b. Color: Red.
 - c. Width: Minimum 3 inches.
 - d. Designation: Warning on tape that electric circuit is located below tape.
 - e. Identifying Letters: Minimum 1-inch high permanent black lettering imprinted continuously over entire length.

B. Raceway Band:

- 1. Slip-on Type:
 - a. Provide heat-shrinkable, black, medium-wall polyolefin tubing with factory-applied adhesive/sealant. Select product size based upon raceway outside diameter.
 - b. Manufacturer and Product: 3M; Type IMCSN, medium wall cable sleeve.
- 2. Wrap-around Type:
 - a. Provide 4-inch width, 20-mil thickness, nonprinted black PVC corrosion protection tape with primer.
 - b. Manufacturer and Product: 3M; Type Scotchrap 51 with Scotchrap Pipe Primer.

2.15 CONDUCTORS AND CABLES

A. Conductors 600 Volts and Below:

- 1. Conform to applicable requirements of NEMA WC 70.

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2. Conductor Type:
 - a. 120- and 277-Volt Lighting, No. 10 AWG and Smaller: Solid copper.
 - b. 120-Volt Receptacle Circuits, No. 10 AWG and Smaller: Solid copper.
 - c. All Other Circuits: Stranded copper.
 3. Insulation Type THHN/THWN, except for sizes No. 6 and larger, with XHHW-2 insulation.
 4. Direct Burial and Aerial Conductors and Cables:
 - a. Type USE/RHH/RHW insulation, UL 854 listed or Type RHW-2/USE-2.
 - b. Conform to physical and minimum thickness requirements of NEMA WC 70.
 5. Flexible Cords and Cables:
 - a. Type SOW-A/50 with ethylene propylene rubber insulation in accordance with UL 62.
 - b. Conform to physical and minimum thickness requirements of NEMA WC 70.
- B. 600-Volt Rated Cable:
1. General:
 - a. Type TC, meeting requirements of UL 1277, including Vertical Tray Flame Test at 20,000 Btu per hour, and NFPA 70, Article 340, or UL 13 meeting requirements of NFPA 70, Article 725.
 - b. Permanently and legibly marked with manufacturer's name, maximum working voltage for which cable was tested, type of cable, and UL listing mark.
 - c. Suitable for installation in open air, in cable trays, or conduit.
 - d. Minimum Temperature Rating: 90 degrees C dry locations, 75 degrees C wet locations.
 - e. Overall Outer Jacket: PVC, flame-retardant, sunlight-resistant and oil-resistant.
 2. Type 1, Multiconductor Control Cable:
 - a. Conductors:
 - 1) 14 AWG, seven-strand copper.
 - 2) Insulation: 15-mil PVC with 4-mil nylon.
 - 3) UL 1581 listed as Type THHN/THWN rated VW-1.
 - 4) Conductor group bound with spiral wrap of barrier tape.
 - 5) Color Code: In accordance with ICEA S-58-679, Method 1, Table 2.

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- b. Cable: Passes the ICEA T-29-520, 210,000 btu per hour Vertical Tray Flame Test.
 - c. Manufacturer and Product: Belden; 9721.
 - 3. Grounding Conductors:
 - a. Equipment: Stranded copper with green, Type USE/RHH/RHW-XLPE or THHN/THWN, insulation.
 - b. Direct Buried: Bare stranded copper.
 - 4. Type 30, Ethernet Cable:
 - a. 600-Volt:
 - 1) Category 6 with overall shield, UL listed and third party verified to comply with TIA/EIA 568.2-D Category 6 requirements.
 - 2) Provide four each individually twisted pair, 24 AWG conductors, with high-density polyethylene insulation and black thermoplastic jacket.
 - 3) Suitable for outdoor use.
 - 4) Cable shall withstand a bend radius of 1-inch minimum at a temperature of minus 20 degrees C maximum without jacket or insulation cracking.
 - 5) Manufacturer and Product: Quabbin; 5925.
 - b. 600 Volt Cable CAT6 Connector:
 - 1) Shielded RJ45 plug with integral C crimp.
 - 2) Performance:
 - a) Meet or exceed ANSI TIA 568.2 D, IEC 60603.
 - b) Meet or exceed ANSI TIA 1096 (formerly FCC Part 68).
 - 3) Operation Temperature: Negative 40 degrees C to plus 85 degrees C.
 - 4) Cable Diameter: Up to 0.310 inch.
 - 5) Accessories: Termination tool, Sentinel 900020, "or-equal."
 - 6) Manufacturer and Product: Sentinel Connector, 111S080090H34, "or-equal."
- C. Accessories:
- 1. Tape:
 - a. General Purpose, Flame Retardant: 7 mils, vinyl plastic, Scotch Brand 33, rated for 90 degrees C minimum, meeting requirements of UL 510.
 - b. Flame Retardant, Cold and Weather Resistant: 8.5 mils, vinyl plastic, Scotch Brand 88.

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- c. Arc and Fireproofing: 30 mils, elastomer.
 - 1) Manufacturers and Products:
 - a) 3M; Scotch Brand 77, with Scotch Brand 69 glass cloth tapebinder.
 - b) Plymout; Plyarc 53, with Plyglas 77 glass cloth tapebinder.
- 2. Identification Devices:
 - a. Sleeve-type, permanent, PVC, yellow or white, with legible machine-printed black markings.
 - b. Manufacturer and Products: Raychem; Type D-SCE or ZH-SCE.
- 3. Connectors and Terminations:
 - a. Nylon, Self-Insulated Crimp Connectors:
 - 1) Manufacturers and Products:
 - a) Thomas & Betts; Sta-Kon.
 - b) Burndy; Insulug.
 - c) ILSCO.
 - 4. Self-Insulated, Freespring Wire Connector (Wire Nuts):
 - a. Plated steel, square wire springs.
 - b. UL Standard 486C.
 - c. Manufacturers and Products:
 - 1) Thomas & Betts.
 - 2) Ideal; Twister.
 - 5. Cable Lugs:
 - a. In accordance with NEMA CC 1.
 - b. Rated 600 volts of same material as conductor metal.
 - c. Uninsulated Crimp Connectors and Terminators:
 - 1) Suitable for use with 75 degrees C wire at full NFPA 70, 75 degrees C ampacity.
 - 2) Manufacturers and Products:
 - a) Thomas & Betts; Color-Keyed.
 - b) Burndy; Hydent.
 - c) ILSCO.
 - d. Uninsulated, Bolted, Two-Way Connectors and Terminators:
 - 1) Manufacturers and Products:
 - a) Thomas & Betts; Locktite.
 - b) Burndy; Quiklug.
 - c) ILSCO.
 - 6. Cable Ties:
 - a. Nylon, adjustable, self-locking, and reusable.
 - b. Manufacturer and Product: Thomas & Betts; TY-RAP.
 - 7. Heat Shrinkable Insulation:
 - a. Thermally stabilized, crosslinked polyolefin.
 - b. Manufacturer and Product: Thomas & Betts; SHRINK-KON.

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D. Pulling Compound:

1. Nontoxic, noncorrosive, noncombustible, nonflammable, water-based lubricant; UL listed.
2. Suitable for rubber, neoprene, PVC, polyethylene, hypalon, CPE, and lead-covered wire and cable.
3. Approved for intended use by cable manufacturer.
4. Suitable for zinc-coated steel, aluminum, PVC, bituminized fiber, and fiberglass raceways.
5. Manufacturers:
 - a. Ideal Co.
 - b. Polywater, Inc.
 - c. Cable Grip Co.

2.16 GROUNDING

A. Ground Rods: Provide copper-clad with minimum diameter of 5/8 inch, and length of 10 feet.

B. Ground Conductors: As specified in Article Conductors and Cable.

C. Connectors:

1. Exothermic Weld Type:
 - a. Outdoor Weld: Suitable for exposure to elements or direct burial.
 - b. Manufacturers:
 - 1) Erico Products, Inc.; Cadweld and Cadweld Exolon.
 - 2) Thermoweld.
2. Compression Type:
 - a. Compress-deforming type; wrought copper extrusion material.
 - b. Single indentation for conductors 6 AWG and smaller.
 - c. Double indentation with extended barrel for conductors 4 AWG and larger.
 - d. Single barrels prefilled with oxide-inhibiting and antiseizing compound.
 - e. Manufacturers:
 - 1) Burndy Corp.
 - 2) Thomas and Betts Co.
 - 3) ILSCO.

2.17 LUMINAIRES AND ACCESSORIES

A. Specific requirements relating to fixture type, lamp type, and mounting hardware are provided on the Drawings.

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B. Poles:

1. Rating (With Luminaire): 100 mph steady winds, without incurred damage.
2. Material: As specified on the Drawings.

C. Exterior Installations:

1. UL Labeled: SUITABLE FOR WET LOCATIONS.
2. Ballast: Removable, prewired.
3. When factory-installed photocells are provided, entire assembly shall have UL label.

2.18 LIGHTING CONTROL

A. Photocell:

1. Automatic ON/OFF switching photo control.
2. Housing: Self-contained, die-cast aluminum, unaffected by moisture, vibration, or temperature changes.
3. Setting: ON at dusk and OFF at dawn.
4. Time delay feature to prevent false switching.
5. Field adjustable to control operating levels.
6. Manufacturers:
 - a. Tork.
 - b. Paragon Electric Company.

B. Time Switch, Electronic Programmable Type:

1. Provide digital electronic time switch with number of channels indicated on the Drawings.
2. Programming:
 - a. Each channel shall be independently programmable and include:
 - 1) A Form C dry contact, output rated for 30 amps at 120V ac for operation on resistive loads.
 - 2) Provide channels with 8 ON/OFF set points in a 24-hour period for each day or the week.
 - 3) Skip-a-day weekly schedule.
 - 4) 365-day capability.
 - 5) Astronomic time functionality.
 - 6) Holiday override capability.
 - 7) Automatic daylight savings changeover.
3. Time Switch Minimum Features:
 - a. Selectable am/pm or 24-hour format.
 - b. 1-minute time resolution.

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- c. Control Inputs: Up to 24 control inputs capable of connection to input devices including photoelectric relays, discrete input devices, etc. for use in programming output channels.
- d. Individual manual ON/OFF override control for each channel.
- 4. Manufacturers:
 - a. Tork.
 - b. Intermatic.
 - c. Paragon Electric Company.

C. MAGNETIC LIGHTING CONTACTOR

- 1. NEMA ICS 2, UL 508.
- 2. Electrically operated by dual-acting, single coil mechanism.
- 3. Inherently interlocked and electrically held in both OPEN and CLOSED position.
- 4. Main Contacts:
 - a. Power driven in both directions.
 - b. Double-break, continuous-duty, rated 30 amperes, 600 volts, withstand rating of 22,000 amps rms symmetrical at 250 volts
 - c. Marked for electric discharge lamps, tungsten, and general-purpose loads.
 - d. Position not dependent on gravity, hooks, latches, or semipermanent magnets.
 - e. Capable of operating in any position.
 - f. Visual indication for each contact.
- 5. Auxiliary contact relay for two-wire control.
- 6. Clamp type, self-rising terminal plates for solderless connections.
- 7. Enclosure: NEMA 250, Type 1, General-purpose, unless otherwise shown.
- 8. Manufacturers:
 - a. ASCO.
 - b. Eaton.
 - c. General Electric Co.

2.19 IN-LINE FUSE HOLDER AND FUSE

A. Fuse Holder:

- 1. General: Waterproof, of corrosion-resistant material.
- 2. Rating: 600 volts.

- B. Fuse:
 - 1. General: Midget, dual element.
 - 2. Rating: 5-amp, voltage as required by application.
- C. Manufacturer: Method Electronics Inc. Network, Buss Division.

PART 3 EXECUTION

3.01 GENERAL

- A. Install materials and equipment in accordance with manufacturer's instructions and recommendations.
- B. Work shall comply with all applicable provisions of NECA 1.
- C. Install materials and equipment in hazardous areas in a manner acceptable to regulatory authority having jurisdiction for the class, division, and group of hazardous areas shown.
- D. Electrical Drawings show general locations of equipment, devices, and raceway, unless specifically dimensioned.

3.02 PROTECTION FOLLOWING INSTALLATION

- A. Protect materials and equipment from corrosion, physical damage, and effects of moisture on insulation.
- B. Cap conduit runs during construction with manufactured seals.
- C. Close openings in boxes or equipment during construction.

3.03 SERVICE ENTRANCE EQUIPMENT AND METERING

- A. Unless otherwise specified or shown, schedule and coordinate work of serving utility as required to provide electric service to the Work.

3.04 OUTLET AND DEVICE BOXES

- A. Install suitable for conditions encountered at each outlet or device in wiring or raceway system, sized to meet NFPA 70 requirements.

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- B. Size:
 - 1. Depth: Minimum 2 inches, unless otherwise required by structural conditions. Box extensions not permitted.
 - a. Hollow Masonry Construction: Install with sufficient depth such that conduit knockouts or hubs are in masonry void space.
 - 2. Switch and Receptacle: Minimum 2-inch by 4-inch sheet steel device box.
- C. Locations:
 - 1. Drawing locations are approximate.
 - 2. To avoid interference with mechanical equipment or structural features, relocate outlets as directed by Owner.
- D. Mounting Height:
 - 1. General:
 - a. Dimensions given to centerline of box.
 - b. Where specified heights do not suit building construction or finish, mount as directed by Owner.
 - 2. Receptacles:
 - a. Outdoor, All Areas: 24 inches above finished grade unless specified on the Drawings.
- E. Install plumb and level.
- F. Flush Mounted:
 - 1. Install with concealed conduit.
 - 2. Install proper type extension rings or plaster covers to make edges of boxes flush with finished surface.
- G. Support boxes independently of conduit by attachment to building structure or structural member.
- H. Box Type (Steel Raceway System):
 - 1. Outdoor Locations: Cast metal.
- I. Box Type, Corrosive Locations (PVC-Coated rigid Galvanized Steel Raceway System): PVC-coated cast metal with matching cover.

3.05 JUNCTION AND PULL BOXES

- A. Install where shown and where necessary to terminate, tap-off, or redirect multiple conduit runs.
- B. Install pull boxes where necessary in raceway system to facilitate conductor installation.
- C. Install in conduit runs at least every 150 feet or after the equivalent of three right-angle bends.
- D. Use outlet boxes as junction and pull boxes wherever possible and allowed by applicable codes.
- E. Use conduit bodies as junction and pull boxes where no splices are required and their use is allowed by applicable codes.
- F. Installed boxes shall be accessible.
- G. Do not install on finished surfaces.
- H. Install plumb and level.
- I. Support boxes independently of conduit by attachment to building structure or structural member.
- J. At or Belowgrade:
 - 1. Install boxes for belowgrade conduit flush with finished grade in locations outside of paved areas, roadways, or walkways.
 - 2. If adjacent structure is available, box may be mounted on structure surface just above finished grade in accessible but unobtrusive location.
 - 3. Obtain Owner's written acceptance prior to installation in paved areas, roadways, or walkways.
 - 4. Use boxes and covers suitable to support anticipated weights.
- K. Flush Mounted:
 - 1. Install with concealed conduit.
 - 2. Holes in surrounding surface shall be no larger than required to receive box.
 - 3. Make edges of boxes flush with final surface.

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L. Mounting Hardware:

1. Noncorrosive Indoor Dry Areas: Galvanized.
2. Outdoor or Noncorrosive Indoor Wet Areas: Stainless steel.
3. Corrosive Areas: Stainless steel.

M. Location/Type:

1. Underground Conduit: Concrete.
2. Outdoor, Where Indicated Weatherproof (WP): NEMA 250, Type 3R.

3.06 PRECAST HANDHOLES

- A. Excavate, shore, brace, backfill, and final grade in accordance with City of Albany Division 2, Section 204.
- B. Do not install until final raceway grading has been determined.
- C. Install such that raceways enter at nearly right angles and as near as possible to one end of wall, unless otherwise shown.

3.07 WIRING DEVICES

A. Switches:

1. Mounting Height: See Article Outlet and Device Boxes.
2. Install with switch operation in vertical position.
3. Install single-pole, two-way switches such that toggle is in up position when switch is on.

B. Receptacles:

1. Install with grounding slot up, except where horizontal mounting is shown, in which case install with neutral slot up.
2. Weatherproof Receptacles:
 - a. Install in cast metal box.
 - b. Install such that hinge for protective cover is above receptacle opening.
3. Ground Fault Interrupter: Install feed-through model at locations where ground fault protection is specified for “downstream” conventional receptacles.
4. Special-Purpose Receptacles: Install in accordance with manufacturer’s instructions.

3.08 DEVICE PLATES

- A. Securely fasten to wiring device; ensure a tight fit to box.
- B. Flush Mounted: Install with all four edges in continuous contact with finished wall surfaces without use of mats or similar materials. Plaster fillings will not be acceptable.
- C. Surface Mounted: Plate shall not extend beyond sides of box, unless plates have no sharp corners or edges.
- D. Install with alignment tolerance to box of 1/16 inch.
- E. Types (Unless Otherwise Shown):
 - 1. Outdoor: Weatherproof.

3.09 PANELBOARDS

- A. Install securely, plumb, in-line and square with walls.
- B. Install top of cabinet 6 feet above floor, unless otherwise shown.
- C. Provide typewritten circuit directory for each panelboard.
- D. Cabinet Location/Type:
 - 1. Wet or Outdoor: NEMA 250, Type 3R, Outdoor.
 - 2. Industrial Use in Areas Not Otherwise Classified: NEMA 250, Type 12, unless otherwise shown.
- E. SPD Application Requirements and Installation:
 - 1. Provide SPDs when indicated on the Drawings or in the equipment specifications.
 - 2. Provide factory-installed SPDs as integral components to new panelboards. Externally mounted SPDs are not acceptable for new distribution equipment.
 - 3. Provide dedicated disconnecting means for SPD devices installed at main service entrance location. Provide dedicated 30-60-ampere circuit breakers (size dependent upon wire size used) with number of poles as required, as disconnecting means for SPD devices. Provide circuit breakers with interrupting capacity equal to that specified for other breakers at that location.

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3.10 CIRCUIT BREAKERS AND SWITCHES

- A. Location and Enclosure Type:
 - 1. Where Denoted WP: NEMA 250, Type 3R.

3.11 SUPPORT AND FRAMING CHANNELS

- A. Install where required for mounting and supporting electrical equipment and raceway systems.
- B. Channel Type:
 - 1. Outdoor, Noncorrosive Locations: Carbon steel.
- C. Paint carbon steel channel cut ends prior to installation with zinc-rich primer.

3.12 NAMEPLATES

- A. Provide identifying nameplate on all equipment.

3.13 CONDUIT AND FITTINGS

- A. General:
 - 1. Crushed or deformed raceways not permitted.
 - 2. Maintain raceway entirely free of obstructions and moisture.
 - 3. Immediately after installation, plug or cap raceway ends with watertight and dust-tight seals until time for pulling in conductors.
 - 4. Sealing Fittings: Provide drain seal in vertical raceways where condensate may collect above sealing fitting.
 - 5. Avoid moisture traps where possible. When unavoidable in exposed conduit runs, provide junction box and drain fitting at conduit low point.
 - 6. Group raceways installed in same area.
 - 7. Follow structural surface contours when installing exposed raceways. Avoid obstruction of passageways.
 - 8. Run exposed raceways parallel or perpendicular to walls, structural members, or intersections of vertical planes.
 - 9. Install watertight fittings in outdoor, underground, or wet locations.
 - 10. Paint threads and cut ends, before assembly of fittings, galvanized conduit or PVC-coated galvanized conduit installed in exposed or damp locations with zinc-rich paint or liquid galvanizing compound.
 - 11. Metal conduit to be reamed, burrs removed, and cleaned before installation of conductors, wires, or cables.

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12. Do not install raceways in concrete equipment pads, foundations, or beams.
13. Horizontal raceways installed under floor slabs shall lie completely under slab, with no part embedded within slab.
14. Install concealed, embedded, and buried raceways so that they emerge at right angles to surface and have no curved portion exposed.
15. Install conduits for fiber optic cables, telephone cables, and Category 5 data cables in strict conformance with the requirements of EIA/TIA 569.

B. Installation in Cast-in-Place Structural Concrete:

1. Minimum cover 2 inches, including all fittings.
2. Conduit placement shall not require changes in reinforcing steel location or configuration.
3. Provide nonmetallic support during placement of concrete to ensure raceways remain in position.
4. Conduit larger than 1 inch shall not be embedded in concrete slabs, walls, foundations, columns or beams, unless approved by Engineer.
5. Slabs and Walls:
 - a. Trade size of conduit not to exceed one-fourth of the slab or wall thickness.
 - b. Install within middle two-fourths of slab or wall.
 - c. Separate conduit less than 2-inch trade size by a minimum ten times conduit trade size, center-to-center, unless otherwise shown.
 - d. Separate conduit 2 inches and greater trade size by a minimum eight times conduit trade size, center-to-center, unless otherwise shown.
 - e. Cross conduit at an angle greater than 45 degrees, with minimum separation of 1 inch.
 - f. Separate conduit by a minimum six times the outside dimension of expansion and deflection fittings at expansion joints.
 - g. Conduit shall not be installed below the maximum water surface elevation in walls of water holding structures.

C. Conduit Application:

1. Diameter:
 - a. Exterior Minimum: 3/4 inch.
2. Outdoor, Exposed: Rigid galvanized steel.
3. Direct Earth Burial:
 - a. Rigid galvanized steel.
 - b. Schedule 40.
4. Under Slabs-On-Grade: Rigid galvanized steel.

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D. Connections:

1. Lighting Fixtures in Dry Areas: Flexible metal, liquid-tight conduit.
2. Outdoor areas, process areas exposed to moisture, and areas required to be oiltight and dust-tight: Flexible metal, liquid-tight conduit.
3. Transition From Underground or Concrete Embedded to Exposed: Rigid galvanized steel conduit.
4. Under Equipment Mounting Pads: Rigid galvanized steel conduit.
5. Exterior Light Pole Foundations: Rigid galvanized steel or PVC Schedule 40 conduit.

E. Penetrations: Make at right angles, unless otherwise shown.

F. Support:

1. Application/Type of Conduit Strap:
 - a. Steel Conduit: Zinc-coated steel, pregalvanized steel, or malleable iron.
 - b. PVC-Coated Rigid Steel Conduit: PVC-coated metal.
 - c. Nonmetallic Conduit: Nonmetallic or PVC-coated metal.
2. Provide and attach wall brackets, strap hangers, or ceiling trapeze as follows:
 - a. Wood: Wood screws.
 - b. Hollow Masonry Units: Toggle bolts.
 - c. Concrete or Brick: Expansion shields, or threaded studs driven in by powder charge, with lock washers and nuts.
 - d. Steelwork: Machine screws.
 - e. Location/Type of Hardware:
 - 1) Dry, Noncorrosive Areas: Galvanized.
 - 2) Wet, Noncorrosive Areas: Stainless steel.
 - 3) Corrosive Areas: Stainless steel.

G. Bends:

1. Install concealed raceways with a minimum of bends in the shortest practical distance.
2. Make bends and offsets of longest practical radius. Bends in conduits and ducts being installed for fiber optic cables shall be not less than 20 times cable diameter, 15 inches minimum.
3. Install with symmetrical bends or cast metal fittings.
4. Avoid field-made bends and offsets, but where necessary, make with acceptable hickey or bending machine. Do not heat metal raceways to facilitate bending.

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5. Make bends in parallel or banked runs from same center or centerline with same radius so that bends are parallel.
 6. Factory elbows may be installed in parallel or banked raceways if there is change in plane of run and raceways are same size.
 7. PVC Conduit:
 - a. Bends 30 Degrees and Larger: Provide factory-made elbows.
 - b. 90-Degree Bends: Provide rigid steel elbows, PVC coated where direct buried.
 - c. Use manufacturer's recommended method for forming smaller bends.
 8. Flexible Conduit: Do not make bends that exceed allowable conductor bending radius of cable to be installed or that significantly restricts conduit flexibility.
- H. Expansion and Deflection Fittings: Provide on all raceways at structural expansion joints and in long tangential runs.
- I. PVC Conduit:
1. Solvent Welding:
 - a. Provide manufacturer recommended solvent; apply to all joints.
 - b. Install such that joint is watertight.
 2. Adapters:
 - a. PVC to Metallic Fittings: PVC terminal type.
 - b. PVC to Rigid Metal Conduit or IMC: PVC female adapter.
 3. Belled-End Conduit: Bevel the unbelled end of the joint prior to joining.
- J. PVC-Coated Rigid Steel Conduit:
1. Install in accordance with manufacturer's instructions.
 2. All tools and equipment used in the cutting, bending, threading, and installation of PVC-coated rigid steel conduit shall be designed to limit damage to the PVC coating.
 3. Provide PVC boot to cover all exposed threading.
- K. Termination at Enclosures:
1. Cast Metal Enclosure: Provide manufacturer's premolded insulating sleeve inside metallic conduit terminating in threaded hubs.
 2. Nonmetallic, Cabinets, and Enclosures: Terminate conduit in threaded conduit hubs, maintaining enclosure integrity.
 3. Sheet Metal Boxes, Cabinets, and Enclosures:
 - a. Rigid Galvanized Conduit:
 - 1) Provide one lock nut each on inside and outside of enclosure.

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- 2) Install grounding bushing.
 - 3) Provide bonding jumper from grounding bushing to equipment ground bus or ground pad; if neither ground bus nor pad exists, connect jumper to lag bolt attached to metal enclosure.
 - 4) Install insulated bushing on ends of conduit where grounding is not required.
 - 5) Provide insulated throat when conduit terminates in sheet metal boxes having threaded hubs.
 - 6) Utilize sealing locknuts or threaded hubs on outside of NEMA 3R and NEMA 12 enclosures.
 - 7) Terminate conduits with threaded conduit hubs at NEMA 4 and 4X boxes and enclosures.
- b. PVC-Coated Rigid Galvanized Steel Conduit: Provide PVC-coated, liquid-tight, metallic connector.
 - c. PVC Schedule 40 Conduit: Provide PVC terminal adapter with locknut.
4. Free-Standing Enclosures:
- a. Terminate metal conduit entering bottom with grounding bushing; provide a grounding jumper extending to equipment ground bus or grounding pad.
 - b. Terminate PVC conduit entering bottom with bell end fittings.

L. Underground Raceways:

1. Grade: Maintain minimum grade of 4 inches in 100 feet, either from one manhole, handhole, or pull box to the next, or from a high point between them, depending on surface contour.
2. Cover: Maintain minimum 2-foot cover above conduit, unless otherwise shown.
3. Make routing changes as necessary to avoid obstructions or conflicts.
4. Couplings: In multiple conduit runs, stagger so couplings in adjacent runs are not in same transverse line.
5. Union type fittings not permitted.
6. Spacers:
 - a. Provide preformed, nonmetallic spacers, designed for such purpose, to secure and separate parallel conduit runs in a trench.
 - b. Install at intervals not greater than that specified in NFPA 70 for support of the type conduit used, but in no case greater than 10 feet.
7. Support conduit so as to prevent bending or displacement during backfilling.

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8. Installation with Other Piping Systems:
 - a. Crossings: Maintain minimum 12-inch vertical separation.
 - b. Parallel Runs: Maintain minimum 12-inch separation.
 - c. Installation over valves or couplings not permitted.
 9. Metallic Raceway Coating: Along entire length, coat with raceway coating.
 10. Backfill: As specified in in City of Albany Division 2, Section 204.
- M. Empty Raceways:
1. Provide permanent, removable cap over each end.
 2. Provide PVC plug with pull tab for underground raceways with end bells.
 3. Provide nylon pull cord.
 4. Identify, as specified in Paragraph Identification Devices, with waterproof tags attached to pull cord at each end, and at intermediate pull point.
- N. Identification Devices:
1. Raceway Tags:
 - a. Identify origin and destination.
 - b. Install at each terminus, near midpoint, and at minimum intervals of every 50 feet of exposed raceway, whether in ceiling space or surface mounted.
 - c. Provide corrosion-resistant wire for attachment.
 2. Warning Tape: Install approximately 12 inches above underground or concrete-encased raceways. Align parallel to, and within 12 inches of, centerline of runs.
- O. Raceway Band: Install wherever metallic conduit emerges from concrete slabs. Not required with PVC-coated RGS conduit. Center band at slab surface and install according to manufacturer's instructions.
1. Slip-on Type: Clean conduit surface at installation location. Cut tubing to 4-inch minimum lengths and slip onto raceway prior to slab placement and termination of conduit. Heat-shrink onto conduit.
 2. Wrap-around Type: Use where slip-on access to conduit is not possible. Clean conduit surface at installation location. Apply primer. Apply wraps to provide two layers of tape. Neatly finish tape end to prevent unraveling.

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3.14 CONDUCTORS AND CABLES

- A. Conductor storage, handling, and installation shall be in accordance with manufacturer's recommendations.
- B. Do not exceed manufacturer's recommendations for maximum pulling tensions and minimum bending radii.
- C. Conduit system shall be complete prior to drawing conductors. Lubricate prior to pulling into conduit. Lubrication type shall be as approved by conductor manufacturer.
- D. Terminate all conductors and cables, unless otherwise shown.
- E. Do not splice conductors, unless specifically indicated or approved by Engineer.
- F. Bundling: Where single conductors and cables in manholes, handholes, vaults, cable trays, and other indicated locations are not wrapped together by some other means, bundle conductors from each conduit throughout their exposed length with cable ties placed at intervals not exceeding 12 inches.
- G. Wiring within Equipment and Local Control Panels: Remove surplus wire, dress, bundle, and secure.
- H. Power Conductor Color Coding:
 - 1. No. 6 AWG and Larger: Apply general purpose, flame retardant tape at each end, and at accessible locations wrapped at least six full overlapping turns, covering an area 1-1/2 inches to 2 inches wide.
 - 2. No. 8 AWG and Smaller: Provide colored conductors.
 - 3. Colors:
 - a. Neutral Wire: White.
 - b. Live Wires, 120/240-Volt, Single-Phase System: Black, red.
 - c. Ground Wire: Green.
- I. Circuit Identification:
 - 1. Circuits Appearing in Circuit Schedules: Identify power, instrumentation, and control conductor circuits, using circuit schedule designations, at each termination and in accessible locations such as manholes, handholes, panels, switchboards, motor control centers, pull boxes, and terminal boxes.

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2. Circuits Not Appearing in Circuit Schedules: Assign circuit name based on device or equipment at load end of circuit. Where this would result in same name being assigned to more than one circuit, add number or letter to each otherwise identical circuit name to make it unique.
 3. Method: Identify with sleeves. Taped-on markers or tags relying on adhesives not permitted.
- J. Conductors 600 Volts And Below:
1. Install 10 AWG or 12 AWG conductors for branch circuit power wiring in lighting and receptacle circuits.
 2. Do not splice incoming service conductors and branch power distribution conductors 6 AWG and larger, unless specifically indicated or approved by Engineer.
 3. Connections and Terminations:
 - a. Install wire nuts only on solid conductors. Wire nuts are not allowed on stranded conductors.
 - b. Install nylon self-insulated crimp connectors and terminators for instrumentation and control, circuit conductors.
 - c. Install self-insulated, set screw wire connectors for two-way connection of power circuit conductors 12 AWG and smaller.
 - d. Install uninsulated crimp connectors and terminators for instrumentation, control, and power circuit conductors 4 AWG through 2/0 AWG.
 - e. Install uninsulated terminators bolted together on motor circuit conductors 10 AWG and larger.
 - f. Place no more than one conductor in any single-barrel pressure connection.
 - g. Install crimp connectors with tools approved by connector manufacturer.
 - h. Install terminals and connectors acceptable for type of material used.
 - i. Compression Lugs:
 - 1) Attach with a tool specifically designed for purpose. Tool shall provide complete, controlled crimp and shall not release until crimp is complete.
 - 2) Do not use plier type crimpers.
 4. Do not use soldered mechanical joints.
 5. Splices and Terminations:
 - a. Insulate uninsulated connections.
 - b. Indoors: Use general purpose, flame retardant tape or single wall heat shrink.

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- c. Outdoors, Dry Locations: Use flame retardant, cold- and weather-resistant tape or single wall heat shrink.
- d. Belowgrade and Wet or Damp Locations: Use dual wall heat shrink.
- 6. Cap spare conductors with UL listed end caps.
- 7. Cabinets, Panels:
 - a. Remove surplus wire, bridle and secure.
 - b. Where conductors pass through openings or over edges in sheet metal, remove burrs, chamfer edges, and install bushings and protective strips of insulating material to protect the conductors.
- 8. Control and Instrumentation Wiring:
 - a. Where terminals provided will accept such lugs, terminate control and instrumentation wiring, except solid thermocouple leads, with insulated, locking-fork compression lugs.
 - b. Terminate with methods consistent with terminals provided, and in accordance with terminal manufacturer's instructions.
 - c. Locate splices in readily accessible cabinets or junction boxes using terminal strips.
 - d. Cable Protection:
 - 1) Under Infinite Access Floors: May install without bundling.
 - 2) All Other Areas: Install individual wires, pairs, or triads in flex conduit under floor or grouped into bundles at least 1/2 inch in diameter.
 - 3) Maintain integrity of shielding of instrumentation cables.
 - 4) Ensure grounds do not occur because of damage to jacket over shield.
- 9. Extra Conductor Length: For conductors to be connected by others, install minimum 6 feet of extra conductor in freestanding panels and minimum 2 feet in other assemblies.

3.15 GROUNDING

- A. Grounding shall be in compliance with NFPA 70 and as shown.
- B. Ground electrical service neutral at service entrance equipment to supplementary grounding electrodes.
- C. Ground each separately derived system neutral to nearest effectively grounded building structural steel member or separate grounding electrode.
- D. Bond together system neutrals, service equipment enclosures, exposed noncurrent-carrying metal parts of electrical equipment, metal raceways, ground conductor in raceways and cables, receptacle ground connections, and metal piping systems.

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- E. Shielded Instrumentation Cables:
 - 1. Ground shield to ground bus at power supply for analog signal.
 - 2. Expose shield minimum 1 inch at termination to field instrument and apply heat shrink tube.
 - 3. Do not ground instrumentation cable shield at more than one point.
- F. Equipment Grounding Conductors: Provide in all conduits containing power conductors and control circuits above 50 volts.
- G. Ground Rods: Install full length with conductor connection at upper end. Install one ground rod in each handhole.

3.16 LUMINAIRES AND ACCESSORIES

- A. Install in accordance with manufacturer's recommendations.
- B. Install plumb and level at mounting heights shown.
- C. Provide proper hangers, pendants, and canopies as necessary for complete installation and meeting specified seismic requirements.
- D. Pole Mounted Fixtures: As shown on the Drawings.
- E. Install symmetrically with suspended ceiling pattern in finished areas.
- F. Unfinished Areas: Locate luminaires to avoid conflict with other building systems or blockage of luminaire light output.
- G. Building Exterior: Provide flush-mounted back box and concealed conduit, unless otherwise shown.

3.17 LIGHTING CONTROL

- A. Outdoor Luminaires: Photocells shall switch lights ON at dusk and OFF at dawn.

3.18 FIELD QUALITY CONTROL

- A. General:
 - 1. Test equipment shall have an operating accuracy equal to, or greater than, requirements established by NETA ATS.
 - 2. Test instrument calibration shall be in accordance with NETA ATS.
 - 3. Perform inspection and electrical tests after equipment has been installed.

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4. Perform tests with apparatus de-energized whenever feasible.
 5. Inspection and electrical tests on energized equipment are to be:
 - a. Scheduled with Owner prior to de-energization.
 - b. Minimized to avoid extended period of interruption to the operating plant equipment.
- B. Tests and inspection shall establish that:
1. Electrical equipment is operational within industry and manufacturer's tolerances.
 2. Installation operates properly.
 3. Equipment is suitable for energization.
 4. Installation conforms to requirements of Contract Documents and NFPA 70.
- C. Perform inspection and testing in accordance with NETA ATS, industry standards, and manufacturer's recommendations.
- D. Adjust mechanisms and moving parts for free mechanical movement.
- E. Adjust adjustable relays and sensors to correspond to operating conditions, or as recommended by manufacturer.
- F. Verify nameplate data for conformance to Contract Documents.
- G. Realign equipment not properly aligned and correct unlevelness.
- H. Properly anchor electrical equipment found to be inadequately anchored.
- I. Tighten accessible bolted connections, including wiring connections, with calibrated torque wrench to manufacturer's recommendations, or as otherwise specified.
- J. Clean contaminated surfaces with cleaning solvents as recommended by manufacturer.
- K. Provide proper lubrication of applicable moving parts.
- L. Investigate and repair or replace:
1. Electrical items that fail tests.
 2. Active components not operating in accordance with manufacturer's instructions.
 3. Damaged electrical equipment.

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- M. Electrical Enclosures:
1. Remove foreign material and moisture from enclosure interior.
 2. Vacuum and wipe clean enclosure interior.
 3. Remove corrosion found on metal surfaces.
 4. Repair or replace, as determined by Engineer, door and panel sections having damaged surfaces.
 5. Replace missing or damaged hardware.
- N. Provide certified test report(s) documenting the successful completion of specified testing. Include field test measurement data.
- O. Test the following equipment and materials:
1. Conductors: Insulation resistance, No. 4 and larger only.
 2. Panelboards, switches, and circuit breakers.
- P. Controls:
1. Test control and signal wiring for proper termination and function.
 2. Test local control panels and other control devices for proper terminations, configuration and settings, and functions.
 3. Demonstrate control, monitoring, and indication functions in presence of Owner and Engineer.
- Q. Balance electrical load between phases on panelboards and mini-power centers after installation.

END OF SECTION

SECTION 26 42 01
PIPE BONDING AND TEST STATIONS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. ASTM International (ASTM): F436, Standard Specification for Hardened Steel Washers.
 2. NACE International (NACE): SP0169, Control of External Corrosion on Underground or Submerged Metallic Piping Systems.
 3. National Electrical Manufacturers Association (NEMA): WC 70, Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy.
 4. NSF International (NSF).
 5. The Society for Protective Coatings (SSPC): SP 1, Solvent Cleaning.

1.02 DEFINITIONS

- A. Electrical Isolation: Condition of being electrically isolated from other metallic structures (including, but not limited to, piping, reinforcement, casings) and the environment as defined in NACE SP0169.
- B. Electrically Continuous Pipeline: Pipeline that has a linear electrical resistance equal to or less than the sum of the resistance of the pipe plus the maximum allowable bond resistance for each joint as specified in this section.
- C. Ferrous Metal Pipe: Pipe made of steel or iron, or pipe containing steel or iron as a principal structural material, except reinforced concrete pipe.
- D. Lead, Lead Wire, Joint Bonds, Pipe Connecting Wires, Cable: Insulated copper conductor; the same as wire.

1.03 SUBMITTALS

- A. Action Submittals: Catalog cuts and information for products proposed for use.
- B. Informational Submittals:
1. Manufacturer's Certificate of Compliance, in accordance with Section 01 43 33, Manufacturers' Field Services.

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2. Field Test Reports, including results of electrical continuity testing and insulated joint testing.
3. Qualifications of Cathodic Protection Specialist.

1.04 QUALITY ASSURANCE

- A. Cathodic Protection Specialist Qualifications: NACE International certified.

PART 2 PRODUCTS

2.01 WIRES

- A. Conform to applicable requirements of NEMA WC 70.
- B. Joint Bond:
 1. General: Single-conductor, stranded copper wire with 600-volt HMWPE insulation. Supply joint bonds complete with formed copper sleeve on each end of wire.
 2. Push-On, Mechanical, or Flanged Joints: 2 AWG wires, 18 inches long.

2.02 THERMITE WELD MATERIALS

- A. General:
 1. Thermite weld materials consist of wire sleeves, welders, and weld cartridges according to weld manufacturer's recommendations for each wire size and pipe or fitting size and material.
 2. Welding materials and equipment shall be product of a single manufacturer. Interchanging materials of different manufacturers is not acceptable.
- B. Molds: Graphite; ceramic "One-Shot" molds not acceptable.
- C. Adapter Sleeves:
 1. For all wire sizes.
 2. Prefabricated factory sleeve joint bonds or bond wires with formed sleeves made in field are acceptable. Attach field-formed joint bond sleeves with appropriate size and type of hammer die furnished by thermite weld manufacturer.
 3. Extend wire conductor 1/4 inch beyond end of sleeve.

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- D. Cartridges: Cast-iron thermite weld cartridges for cast and ductile iron pipe and fittings.
 - 1. Maximum Cartridge Size: 25 grams for steel and 32 grams for cast and ductile iron materials, respectively.
- E. Welders and Cartridges: For attaching copper wire to pipe material:

Pipe Material	Weld Type	Cartridge Size, Max.
4 AWG Wire and Smaller:		
Steel	HA, VS, HC	25 gm
Ductile Iron	HB, VH, HE	32 gm
Cast Iron	HB, VH, HE	32 gm
2 AWG Joint Bonds:		
Steel	FS	25 gm
Ductile or Cast Iron	FC	32 gm
Concrete Cylinder Pipe	HA, GR	32 gm

- F. Welding Materials Manufacturers:
 - 1. Erico Products Inc. (Cadweld), Cleveland, OH.
 - 2. Continental Industries, Inc. (Thermo-Weld), Tulsa, OK.
- G. Thermite Weld Coating:
 - 1. Thermite Weld Caps: Prefabricated weld cap with coating and suitable primer, such as Handy Cap II with Royston Primer 747, as manufactured by Royston Laboratories, Inc.
 - 2. Use products recommended by pipe or fitting coating manufacturer to repair spot damage at thermite weld connections not covered by standard pipeline coating repair procedure or thermite weld cap.

2.03 ANCILLARY MATERIALS

- A. Mastic Coating: TC Mastic (Brush Applied) as manufactured by Tapecoat Co., Evanston, IL.
- B. Wire Connectors: One-piece, tin-plated crimp-on lug connector as manufactured by Burndy Co. or Thomas and Betts.

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C. Compression Connectors:

1. For in-line, tap, and multisplice furnish “C” taps made of conductive wrought copper, sized to fit wires being spliced.
2. Manufacturer and Product: Burndy; Type “YC.”

D. Splicing and Electrical Tape:

1. Linerless rubber high-voltage splicing tape and vinyl electrical tape suitable for moist and wet environments.
2. Manufacturer and Products: 3M Products; Scotch 130 C and Scotch 88.

E. Insulated Joints:

1. Flanges: For ductile iron pipe flanges, provide standard hole diameters.
2. Fasteners: Minimum bolt length shall be the sum of the mating flanges maximum thicknesses, sealing gasket, insulating and steel washer thickness, and depth of the nut plus 1/8 inch minimum before torquing. Since insulating sleeves may not fit over unthreaded portions of fasteners, bolts shall be cut thread full body or threaded rod as required to meet inside diameter dimensions of insulating sleeves specified herein.
3. Gaskets: Full-face Type E with elastomeric sealing element. Sealing element shall be retained in a groove within retainer portion of gasket.
4. Insulating Sleeves: Full-length fiberglass reinforced epoxy (NEMA G-10 grade).
5. Insulating Washers: Fiberglass reinforced epoxy (NEMA G-10 grade).
6. Non-conductive lubrication shall be packaged with each kit, with a friction factor of 0.19.
7. Steel Washers: Hardened steel, ASTM F436, 1/8 inch thick.
 - a. Provide two washers per bolt for flange diameters equal to or less than 36-inch diameter.
 - b. Provide four washers per bolt for flange diameters larger than 36-inch diameter.
8. Manufacturers and Products:
 - a. Lamons; ISOGUARD.
 - b. GPT; LineBacker.
 - c. Advance Products and Systems; Trojan.

2.04 FUNCTIONAL TEST EQUIPMENT

A. Test Equipment:

1. Before construction begins, obtain test equipment necessary for electrical continuity testing, and the following equipment:
 - a. Model 601, Aboveground and 702, Buried Insulation Checkers, as manufactured by Gas Electronics Co., Seymour, MO.
 - b. One Model 77 Series III, Digital Multimeter, with case and test leads, as manufactured by Fluke Corporation, Everett, WA.
 - c. Two Model 6B copper-copper sulfate reference electrodes as manufactured by Tinker and Rasor, San Gabriel, CA.
 - d. One quart of copper sulfate antifreeze solution.
 - e. One-half pound of copper sulfate crystals.

- B. Store test equipment at Site and maintain in accurately calibrated, working condition. Test equipment shall be available to Engineer for testing purposes. Upon completion of Project, test equipment listed above shall be turned over to Owner in clean, accurate, and fully functional condition, along with operating manuals, test wires, and cases supplied with equipment.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Construct system of pipe joint bonds to form discrete electrically continuous piping sections.

3.02 PIPE JOINT BONDING

- A. Install two joint bond wire assemblies at each joint that requires bonding.
- B. Use thermite weld process for electrical connection of wires to pipe and fittings.
- C. Test each bonded joint for continuity before backfilling.

3.03 WIRE CONNECTIONS

A. Thermite Weld:

1. Use thermite weld method for electrical connection of copper wire to steel, ductile, and cast-iron surfaces. Observe proper safety precautions, welding procedures, thermite weld material selection, and surface preparation recommended by welder manufacturer. Ensure that pipe or

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fitting wall thickness is of sufficient thickness that thermite weld process will not damage integrity of pipe or fitting wall or protective lining.

2. After weld connection has cooled, remove slag, visually inspect, and physically test wire connection by tapping with a hammer; remove and replace defective connections.
3. Install prefabricated thermite weld cap over each completed connection. Repair exposed metal surfaces not covered by thermite weld cap in accordance with coating manufacturer's recommendations. Repair damage to pipe lining in accordance with lining applicator's recommendations.

3.04 WIRE INSULATION REPAIR

- A. Handle wires with care. Splices for damage to wire insulation shall be required by spirally wrapping (50 percent overlap, minimum) with two coats of high-voltage rubber splicing tap and two layers of vinyl electrical tape. Make wire splices with suitable sized compression connectors or mechanically secure and solder with rosin cored 50/50 solder. Splices shall be approved by Engineer.

3.05 INSULATED JOINTS

- A. Install insulated joints to electrically isolate new metallic piping from existing metallic piping and dissimilar metals.
- B. Align and install insulating joints as shown on the Drawings and according to manufacturer's recommendations.
- C. Do not use fastener lubricants that contain graphite or metallic compounds that will interfere with the insulating capability of the completed joint.
- D. Lining and Coating:
 1. After assembly of insulated flanges, repair coatings and linings using original materials in accordance with manufacturer's instructions.
 2. After coatings and linings are repaired, provide V-bio polyethylene encasement.

3.06 FIELD QUALITY CONTROL

A. Electrical Continuity Testing:

1. Provide necessary equipment and materials, and make electrical connections to pipe as required to test continuity of bonded joints.
2. Conduct continuity test on buried joints that are required to be bonded. Test electrical continuity of joint bonds after bonds are installed but before backfilling of pipe.
3. Have Cathodic Protection Specialist perform tests of bonded joints.
4. Test electrical continuity of each completed joint bond before backfilling using either a digital low resistance ohmmeter or by Calculated Resistance Method, at Contractor's option.
 - a. Digital Low Resistance Ohmmeter Method:
 - 1) Provide the following equipment and materials:
 - a) One Biddle Model 247001 digital low resistance ohmmeter.
 - b) One set of duplex helical current and potential hand spikes, Biddle Model No. 241001, cable length as required.
 - c) One calibration shunt rated at 0.001 ohm, 100 amperes, Biddle Model No. 249004.
 - 2) Test Procedure:
 - a) Measure resistance of joint bonds with low resistance ohmmeter in accordance with manufacturer's written instructions.
 - b) Use helical hand spikes to contact pipe on each side of joint, without touching thermite weld or bond.
 - c) Clean contact area to bright metal by filing or grinding and without surface rusting or oxidation.
 - d) Record measured joint bond resistance on test form described herein.
 - e) Repair damaged pipe coating.
 - b. Calculated Resistance Method:
 - 1) Provide the following equipment and materials:
 - a) One dc ammeter (meter or clamp-on) with full scale reading of 100 amperes and a minimum resolution of 1 ampere or a 100-ampere shunt with a voltmeter as specified herein.
 - b) One high resistance electronic voltmeter with a dc low range of 200 millivolts full scale to a dc high range of 20 volts full scale and capable of a minimum resolution of 1 millivolt (two voltmeters are required if a shunt is used).

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- c) One knife switch, safety switch, or time controlled relay suitable for test current.
 - d) Two electrical probes for the voltmeter.
 - e) Insulated wire suitable for carrying the test current, length as required.
 - f) One dc power supply with a steady capacity of 50 amperes minimum; storage batteries are not an acceptable power supply.
 - g) Test Procedure: Either tightly clamp or thermite weld current wire connections to the pipe. Determine wire size for the test current, and do not exceed 1,000 feet in length.
- c. Apply a minimum direct current of 50 amperes.
 - d. Measure voltage drop across each joint with voltmeter by contacting pipe on each side of joint. Voltmeter connections to bond wire or thermite welds will not be acceptable.
 - e. Measure current applied to test span and voltage drop across joint simultaneously.
 - f. Record measured voltage drop and current for each joint of test form described herein and calculate bond resistance in accordance with the following formula:

$$R = \frac{E}{I}$$

Where:

- R = Resistance of the joint bond.
- E = Measured voltage drop across the joint, in volts.
- I = Test current applied to the pipe test span, in amperes.

- 5. Joint Bond Acceptance:
 - a. Joint Bond Resistance: Less than or equal to the maximum allowable bond resistance values in Table 1.

Table 1		
Joint Type	Max. Allowable Resistance	
	1 Bond/Joint	2 Bonds/Joint
Push-On or Mechanical	0.000325 ohm	0.000162 ohm
Flexible Coupling	0.000425 ohm	0.000212 ohm
Concrete Cylinder	0.000200 ohm	0.000100 ohm

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- b. Replace joint bonds that exceed the allowable resistance. Retest replacement joint bonds for compliance with bond resistance.
 - c. Repair defective joint bonds discovered during energizing and testing.
6. Record Tests of Each Bonded Pipeline:
- a. Description and location of pipeline tested.
 - b. Starting location and direction of test.
 - c. Date of test.
 - d. Joint type.
 - e. Test current and voltage drop across each joint and calculated bond resistance (Calculated Resistance Method only).
 - f. Measured joint bond resistance (Digital Low Resistance Ohmmeter method only).
 - g. Record test information on a form that includes information listed above.

B. Insulated Joint Testing:

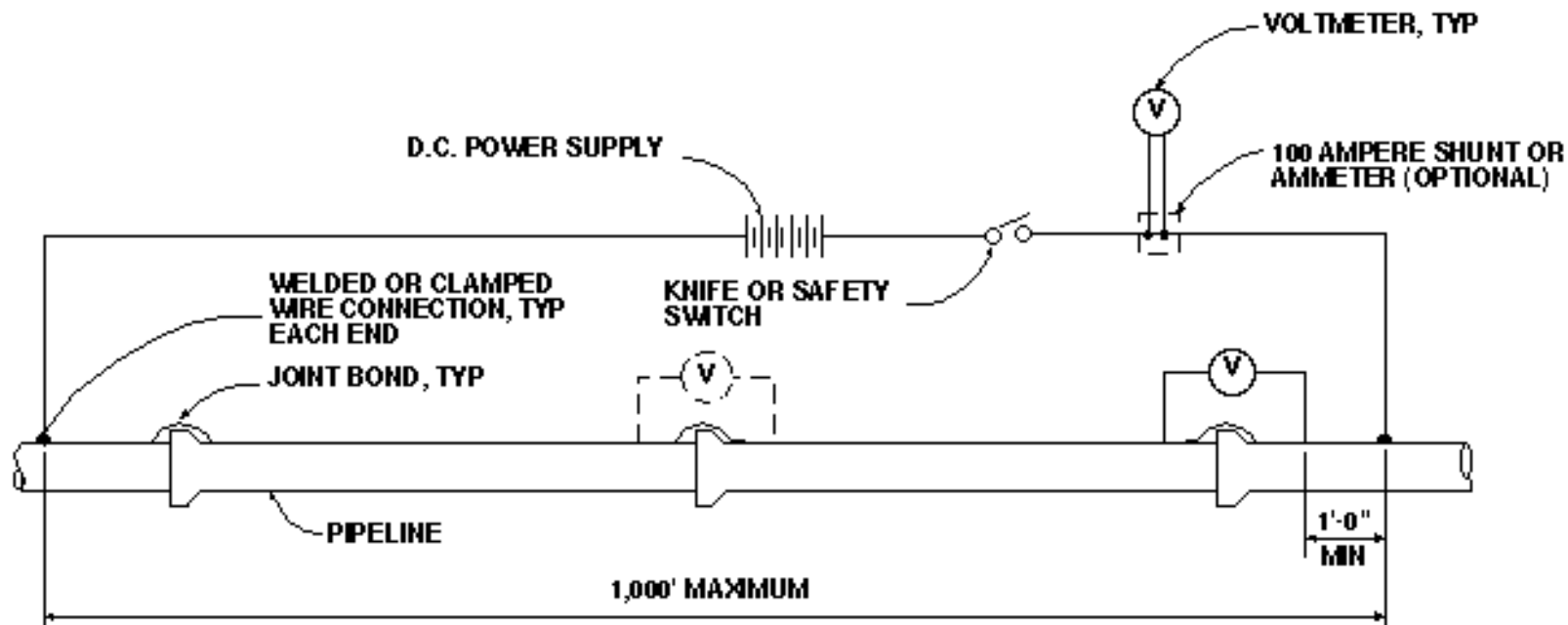
- 1. Provide Engineer with 3 days' advance notice before beginning tests.
- 2. Cathodic Protection Specialist shall perform the tests.
- 3. Test each joint after assembly with insulator tester in accordance with manufacturer's written instructions.
- 4. For insulating flanges, test and record insulating values of each bolt in addition to the completed flange.
- 5. Replace damaged or defective insulation parts.
- 6. Correct defects identified during testing.

3.07 SUPPLEMENT

A. The supplement listed below, following "End of Section," is a part of this specification:

- 1. Joint Bond Continuity Test Schematic.

END OF SECTION



JOINT BOND CONTINUITY TEST SCHEMATIC

JTE195.SP 104-17-95.mdb

SECTION 26 42 02
GALVANIC ANODE CATHODIC PROTECTION SYSTEM

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. ASTM International (ASTM):
 - a. B843, Standard Specification for Magnesium Alloy Anodes for Cathodic Protection
 - b. G97, Standard Test Method for Laboratory Evaluation of Magnesium Sacrificial Anode Test Specimens for Underground Applications.
 2. National Fire Protection Association (NFPA): 70, National Electrical Code (NEC).

1.02 DEFINITIONS

- A. Ferrous Metal Pipe: Pipe made of steel or iron, and pipe containing steel or iron as a principle structural material, except reinforced concrete.
- B. Lead, Lead Wires, Joint Bonds, Cable: Insulated copper conductor; the same as wire.
- C. Pipe Section: A single fitting or a single piece of pipe less than 20 feet in length. Pipe Sections between 20 feet and 40 feet in length shall be treated as two Pipe Sections. Each 20 feet of pipe and fittings with joint bonds may be treated as one Pipe Section.

1.03 SUBMITTALS

- A. Action Submittals: Catalog cuts and other information for products to be used.
- B. Informational Submittals:
1. Compliance Statement: Provide compliance statement that galvanic anode composition meets chemical requirements specified herein.
 2. Test data for open circuit potential measurements and electrochemical capacity for high potential magnesium anodes, as specified herein.
 3. Field test reports.
 4. Cathodic Protection Specialist qualifications.

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1.04 QUALITY ASSURANCE

- A. Cathodic Protection Specialist Qualifications: National Association of Corrosion Engineers (NACE) certified.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping: Provide electrode packaged in a plastic or heavy paper bag of sufficient thickness to protect electrode, backfill, and cloth bag during normal shipping and handling.
- B. Store prepackaged anodes off the ground and keep them dry. Protect against weather, condensation, and mechanical damage. Immediately remove wet or mechanically damaged prepackaged anodes from Site. Handle anodes with care to prevent loss of backfill material. Do not lift or hold anodes by lead wire.

PART 2 PRODUCTS

2.01 GALVANIC ANODES

- A. Magnesium Anodes:
 - 1. Composition: High potential magnesium, ASTM B843, Grade M1C.
 - 2. Open Circuit Potential and Electrochemical Capacity:
 - a. Open Circuit Potential: Negative 1.70 volts or more negative to a copper-copper sulfate reference electrode.
 - b. Electrochemical Capacity: 490 ampere hours at 50 percent efficiency, minimum.
 - c. As determined by laboratory testing using ASTM G97.
 - 3. Dimensions:
 - a. Packaged Length: 28 inches minimum.
 - b. Bare Weight: 32 pounds minimum.
- B. Anode Wire: Furnish each anode with 10 AWG stranded-copper wire with THWN insulation, 10 feet long.
- C. Wire-to-Anode Connection: Manufacturer's standard. Anode connection shall be stronger than the wire.

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D. Backfill:

1. Composition:
 - a. Ground Hydrated Gypsum: 75 percent.
 - b. Powdered Wyoming Bentonite: 20 percent.
 - c. Anhydrous Sodium Sulfate: 5 percent.
2. Grain Size: 100 percent passing through a 20-mesh screen and 50 percent retained by a 100-mesh screen.
3. Mixture: Thoroughly mixed and firmly packaged around galvanic anode within cloth bag by means of adequate vibration.
4. Quantity of backfill shall be sufficient to cover surfaces of anode to a depth of 1 inch.

E. Insulation Colors:

1. Galvanic Anodes: Black.

2.02 ANCILLARY MATERIALS

A. Compression Connectors:

1. For in-line, tap, and multisplice compression connectors furnish "C" taps made of conductive wrought copper, sized to fit wires being spliced.
2. Manufacturer and Product: Burndy; Type YC.

B. Wire Connectors: One-piece, tin-plated crimp-on lug connector as manufactured by Burndy Co. or Thomas and Betts.

C. Splicing Tape: Linerless rubber high-voltage splicing tape suitable for moist and wet environments; Scotch 130C and Scotch 88, as manufactured by 3M Products.

D. Earthfill: Native soil free of roots and other organic matter, ashes, cinders, trash, debris, and rocks.

2.03 THERMITE WELD MATERIALS

A. General:

1. Thermite wire sleeves, welders, and weld cartridges according to manufacturer's recommendations for each wire size, pipe or fitting size, and material.

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2. Welding materials and equipment shall be the product of a single manufacturer. Interchanging materials of different manufacturers will not be acceptable.
- B. Molds: Graphite. Ceramic “One-Shot” molds are not acceptable.
- C. Cartridges:
1. Cast-iron thermite weld cartridges for cast and ductile iron pipe and fittings.
 2. Maximum Cartridge Size:
 - a. 25 grams for steel material.
 - b. 32 grams for cast and ductile iron materials.
- D. Welding Materials Manufacturers:
1. Erico Products Inc. (Cadweld), Cleveland, OH.
 2. Continental Industries, Inc. (Thermo-Weld), Tulsa, OK.
- E. Thermite Weld Caps:
1. Prefabricated weld cap with coating and suitable primer.
 2. Handy Cap II with Royston Primer 747, as manufactured by Royston Laboratories, Inc.

2.04 COATING REPAIR MATERIAL FOR PIPE AND FITTINGS

- A. As recommended by pipe or fitting coating manufacturer for spot damage at thermite weld connections not covered by standard pipeline coating repair procedure or thermite weld cap.
- B. Material: 100 percent solids epoxy that cures in submerged or buried conditions.
- C. Manufacturers and Products:
1. Carboline, St. Louis, MO; Carboguard A-788 Splash Zone Mastic.
 2. Raven Linings, Tulsa, OK; Aquatapoxy A-7.

PART 3 EXECUTION

3.01 GENERAL

- A. Construct galvanic anode cathodic protection system on ductile iron pipe and appurtenances and fittings used in conjunction with nonmetallic pipe.
- B. Conform to NFPA 70.

3.02 GALVANIC ANODE INSTALLATION

- A. General:
 - 1. Install galvanic 1 foot below pipe invert and 5 feet from pipeline as shown on the Drawings.
 - 2. Alternate anode placement on opposite sides of pipe.
 - 3. Provide minimum anode spacing of 2 feet from other unprotected pipelines.
 - 4. Thoroughly compact earthfill around each anode to a point 1-foot above anode. Stop backfill below grade to allow for placing of topsoil, when required.
 - 5. Bury anode wires a minimum of 24 inches below finish grade.
- B. Ductile Iron: Install anodes as shown on the Drawings or as specified.

3.03 WIRE CONNECTIONS TO PIPE

- A. Make electrical connection of copper wire to steel, ductile, and cast-iron surfaces using thermite weld method. Observe proper safety precautions, welding procedures, thermite weld material selection, and surface preparation as recommended by manufacturer. Assure pipe or fitting wall thickness is of sufficient thickness that thermite weld process will not damage integrity of pipe or fitting wall or protective lining.
- B. Before connection is made, clean surface to bare metal by making a 2-inch by 2-inch window in coating, and then filing or grinding surface to produce a bright metal finish. Grinding shall be with a vitrified type grinding wheel; use of resin, rubber, or shellac impregnated type grinding wheels is not acceptable. Prepared metal surface shall be dry.
- C. Install wire sleeves on the ends of the wires before welding to metal surface. Perform thermite welding in strict accordance with manufacturer's written instructions. After weld connection has cooled, remove slag and physically test wire connection by tapping with a hammer; remove and replace defective connections.

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- D. Install prefabricated thermite weld cap over each completed connection. Repair exposed metal surfaces not covered by thermite weld cap in accordance with coating manufacturer's recommendations. Repair damage to pipe lining in accordance with lining applicator's recommendations.

3.04 WIRE INSULATION REPAIR

- A. Repair splices or damage to wire insulation by spirally wrapping (50 percent overlay, minimum) with two coats of splicing tape and two layers of vinyl electrical tape. Make wire splices with suitable sized compression connectors or mechanically secure and solder with rosin cored 50/50 solder. Splices shall be approved by Engineer.

3.05 FIELD TESTING

- A. Provide Cathodic Protection Specialist to visit Site during installation of galvanic anode cathodic protection system. Cathodic Protection Specialist shall be responsible to ensure compliance with these Specifications, and for observation and testing services.
- B. Energizing and Testing: Collect native potential on each protected pipe section before anode attached. Collect on potential on each protected pipe section after anode attached. Upon completion of such tests, Cathodic Protection Specialist who conducted the tests shall tabulate and report the data recorded.

END OF SECTION

SECTION 32 05 33
LANDSCAPE ESTABLISHMENT

PART 1 GENERAL

1.01 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
1. ASTM International (ASTM):
 - a. D2103, (2015) Standard Specification for Polyethylene Film and Sheeting.
 - b. D5851, (1995; R 2015) Planning and Implementing a Water Monitoring Program.
 - c. D6155, (2019) Nontraditional Coarse Aggregate for Bituminous Paving Mixtures.
 2. Tree Care Industry Association (TCIA): Z133 (2017) American National Standard for Arboricultural Operations - Pruning, Repairing, Maintaining, and Removing Trees, and Cutting Brush - Safety Requirements.

1.02 DEFINITIONS

- A. Pesticide: Any substance or mixture of substances, including biological control agents, that may prevent, destroy, repel, or mitigate pests and are specifically labeled for use by the U.S. Environmental Protection Agency (EPA). Also, any substance used as a plant regulator, defoliant, disinfectant, or biocide. Examples of pesticides include fumigants, herbicides, insecticides, fungicides, nematicides, molluscicides, and rodenticides.
- B. Planter Beds: A planter bed is defined as an area containing one or a combination of the following plant types: shrubs, vines, wildflowers, annuals, perennials, ground cover, and a mulch topdressing excluding turf. Trees may also be found in planter beds.
- C. Stand of Turf: 95 percent ground cover of the established species.

1.03 RELATED REQUIREMENTS

- A. Section 32 84 23, Landscape Irrigation Systems, applies to this section for installation of irrigation equipment requirements, with additions and modifications herein.

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- B. Section 32 92 00, Turf and Grasses, applies to this section for installation of seed requirements, with additions and modifications herein.
- C. Section 32 93 00, Plants, applies to this section for installation of trees, shrubs and ground cover, with additions and modifications herein.

1.04 SUBMITTALS

- A. Action Submittals:
 - 1. Operation and Maintenance (O&M) Manual for planting materials as described in Article Maintenance.
 - 2. Integrated Pest Management Plan.
- B. Informational Submittals: Landscape maintenance qualifications.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver fertilizer, to the Site in original containers bearing manufacturer's chemical analysis, name, trade name, or trademark, and indication of conformance to state and federal laws.
- B. Storage:
 - 1. Fertilizer, Storage: Store material in designated areas. Store in cool, dry locations away from contaminants.
 - 2. Antidesiccant's Storage: Do not store with fertilizers or other landscape maintenance materials.
- C. Handling: Do not drop or dump materials from vehicles.

1.06 MAINTENANCE

- A. Submit Operation and Maintenance (O&M) Manuals for planting materials. Include instructions indicating procedures during one typical year including variations of maintenance for climatic conditions throughout the year. Provide instructions and procedures for watering; promotion of growth, including fertilizing, pruning, and mowing; and integrated pest management. O&M Manuals must include pictures of planting materials cross referenced to botanical and common names, with a description of the normal appearance in each season.

PART 2 PRODUCTS

2.01 POST-PLANT FERTILIZER

- A. Fertilizer for groundcover, wildflowers, and grasses is not permitted. Provide fertilizer for trees, plants, and shrubs as recommended by plant supplier, except synthetic chemical fertilizers are not permitted. Fertilizers containing petrochemical additives or that have been treated with pesticides or herbicides are not permitted.

2.02 WATER

- A. Source of water must be approved by the City Engineer and be of suitable quality for irrigation.

2.03 MULCHES TOPDRESSING

- A. Free from noxious weeds, mold, pesticides, or other deleterious materials.
 - 1. Inert Mulch Materials: Provide stone, riverbank stone, crushed pit-run rock, granite chips, complying with ASTM D6155.
 - 2. Organic Mulch Materials: Provide wood cellulose fiber, wood chips, shredded hardwood, shredded redwood bark, pine straw mulch, pine needles, or from Site when available. Wood cellulose fiber must be processed to contain no growth or germination-inhibiting factors, dyed with non-toxic, biodegradable dye to an appropriate color to facilitate visual metering of materials application. Paper-based hydraulic mulch must contain a minimum of 100 percent post-consumer recycled content. Wood-based hydraulic mulch must contain a minimum of 100 percent total recovered materials content.
 - 3. Recycled Organic Mulch: Recycled mulch may include compost, tree trimmings, or pine needles with a gradation that passes through a 2-1/2-inch by 2-1/2-inch screen.

2.04 PESTICIDES

- A. Pesticides and herbicides are not permitted. Submit an Integrated Pest Management Plan, including weed and pest management strategies, proposed alternatives to herbicides and pesticides. Use biological pest controls as approved in the Plan.

PART 3 EXECUTION

3.01 EXTENT OF WORK

- A. Provide landscape construction maintenance to include irrigation equipment cleaning and adjustments, mowing, edging, overseeding, fertilizing, watering, weeding, pruning, stake and guy adjusting, for all newly installed landscape areas and existing plant material, unless indicated otherwise, and at all areas inside or outside the limits of the construction that are disturbed by the Contractor's operations.
 - 1. Policing: Police all landscaped areas. Policing includes removal of leaves, branches, and limbs regardless of length or diameter, dead vegetation, paper, trash, cigarette butts, garbage, rocks or other debris. Policing must extend to both sides of fencing or walls. Collected debris must be promptly removed and disposed of at an approved disposal site.
 - 2. Drainage System Maintenance: Remove all obstructions from surface and subsurface drain lines to allow water to flow unrestricted in swales, gutters, catch basins, storm drain curb inlets, and yard drains. Remove grates and clear debris in catch basins. Open drainage channels are to be maintained free of all debris and vegetation at all times. Edges of these channels must be clear of any encroachment by vegetation.

3.02 IRRIGATION ESTABLISHMENT PERIOD

- A. Approval and acceptance of street tree installation will be conditioned upon the Contractor providing an acceptable irrigation schedule. The Contractor shall be responsible for irrigating all street trees to sustain an unstressed growing condition throughout the establishment period. Regardless of the submitted irrigation schedule, the Contractor is ultimately responsible for tree survival throughout the establishment period and is required to increase the irrigation frequency as necessary to avoid stressing trees.
- B. The irrigation establishment period will commence on the date that inspection by the City Engineer shows that the new irrigation equipment furnished under this Contract have been satisfactorily installed and is functional and must continue for a period of 2 years.
 - 1. Maintenance During the Irrigation Establishment Period: Begin maintenance immediately after irrigation equipment has been installed and is functional. Inspect irrigation equipment at least once a week during the installation and establishment period and perform needed maintenance promptly. Automatic controllers not equipped with rain shut-off sensors must be turned off during periods of rain that exceed 12 hours of continuous rainfall in one day or during rainstorms of one

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day or more. Once the rain has subsided timers must be reactivated. Irrigation controllers must be inspected and reprogrammed after power outages. Contractor must be responsible for winterization and startup. Sprinkler heads must direct water away from buildings and hard surfaced areas.

2. Water Restrictions: Abide by state, local or other water conservation regulations in force during the establishment period. Automatic controller must be adjusted to comply with the water conservation regulations schedule.
3. Fire Hydrants: To use a fire hydrant for irrigation, obtain prior clearance from the City Engineer and provide the tools and connections approved for use on fire hydrants. If a fire hydrant is used, Provide a reduced pressure backflow preventer for each connection between hose and fire hydrant. Backflow preventer used must be tested once per month by a certified backflow preventer tester.
4. Final Acceptance: Upon completion of the irrigation establishment period and final acceptance of groundcover and exterior plants, and irrigation. Operation and coverage test is acceptable if system operates through at least one complete cycle for areas to be irrigated and all leaks or repairs have been completed.
5. Controller Charts: Provide one chart for each controller supplied. Indicate in chart area controlled by the automatic controller. The chart is a reduction of the actual plan(s) that will fit the maximum dimensions inside the controller housing. Use a black line print for the chart and a different pastel or transparent color to indicate each station zone of coverage. After chart is completed and approved for final acceptance, seal chart between two 20 mil pieces of clear plastic.

3.03 GROUNDCOVER ESTABLISHMENT PERIOD

- A. Groundcover establishment period will commence on the date that inspection by the City Engineer shows that the new turf furnished under this Contract has been satisfactorily installed to a 95 percent stand of coverage. The establishment and warranty period must continue for a period of 2 years as identified in Division 01, General Requirements.
 1. Frequency of Maintenance: Begin maintenance immediately after turf has been installed. Inspect area(s) once a week during the installation and establishment period and perform needed maintenance promptly.

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2. Promotion of Growth: Maintain groundcover in a manner that promotes proper health, growth, natural color. Turf must have a neat uniform manicured appearance, free of bare areas, ruts, holes, weeds, pests, dead vegetation, debris, and unwanted vegetation that present an unsightly appearance. Mow as approved in Operation and Maintenance Plan, remove excess clippings, eradicate weeds, water, fertilize, overseed, and perform other operations necessary to promote growth, as approved by City Engineer and consistent with approved Integrated Pest Management Plan. Remove noxious weeds common to the area from planting areas.
3. Mowing:
 - a. Turf: Mow turf at a uniform finished height as approved in the Maintenance and operation plan. Mow turfed area(s) to reduce fire fuel for defensible space or to increase native seed growth. Perform mowing of turf in a manner that prevents scalping, rutting, bruising, uneven and rough cutting. Prior to mowing, all rubbish, debris, trash, leaves, rocks, paper, and limbs or branches on a turf area must be picked up and disposed. Adjacent paved areas must be swept/vacuumed clean.
 - b. Native Grasses: Mow above height of native grass seedlings (approximately 3.5 inches to 4 inches. Mow during spring or early summer. Do not mow after early summer during the second growing season.
4. Post-Fertilizer Application: Do not fertilize wildflowers, groundcover, and grasses.
5. Turf Watering: Perform irrigation in a manner that promotes the health, growth, color and appearance of cultivated vegetation and that complies with all Federal, State, and local water agencies and authorities directives. The Contractor must be responsible to prevent over watering, water run-off, erosion, and ponding due to excessive quantities or rate of application. Abide by state, local, or other water conservation regulations or restrictions in force during the establishment period. Provide water throughout the germination period and acceptance.
6. Turf Clearance Area: Trees located in turf areas must be maintained with a growth free clearance of 18 inches from the tree trunk base. The use of mechanical weed whips to accomplish the turf growth free bed area is prohibited.
7. Replanting: Replant in accordance with Section 32 92 00, Turf and Grasses, and within specified planting dates areas which do not have a satisfactory stand of turf. Replant areas which do not have a satisfactory stand of other groundcover and grasses.

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8. Final Inspection and Acceptance: Final inspection will be made upon written request from the Contractor at least 10 days prior to the last day of the turf establishment period. Final turf acceptance will be based upon a satisfactory stand of turf. Final acceptance of wildflower and grass areas will be based upon a stand of 95 percent groundcover of established species.
9. Unsatisfactory Work: When work is found to not meet design intent and specifications, maintenance period will be extended at no additional cost to the Government until work has been completed, inspected, and accepted by City Engineer.

3.04 TREE AND PLANT ESTABLISHMENT PERIOD

- A. The tree and plant establishment and warranty period will commence on the date that inspection by the City Engineer shows that the new trees and plants, furnished under this Contract have been satisfactorily installed. The establishment and warranty period for all trees and plantings is 2 years as identified in Division 01, General Requirements. During the establishment period, and until final inspection, the Contractor shall be responsible for care of the planting to maintain a vigorous growing condition by watering, pruning, cultivating, repairing, adjusting tree stakes, spraying for pest control, removing dead trees or trees not showing vigorous growth, and replacing missing or damaged plants.
 1. Frequency of Maintenance: Begin maintenance immediately after trees and plants have been installed. Inspect trees and plants at least once a week during the installation and establishment period and perform needed maintenance promptly.
 2. Promotion of Plant Growth and Vigor: Water, prune, fertilize, mulch, adjust stakes, eradicate weeds, and perform other operations necessary to promote plant growth, and vigor.
 3. Planter Bed Maintenance: Planter beds must be weeded, fertilized, irrigated, kept pest free, turf free, pruned, and mulch levels maintained. Planter beds will not be allowed to encroach into turf areas. A definite break must be maintained between turf areas and planter beds. Fertilize exterior planting materials to promote healthy plant growth without encouraging excessive top foliar growth. Remove noxious weeds common to the area from planting areas by mechanical means.
 - a. Shrub Selective Maintenance:
 - 1) In addition to the above requirements, shrubs must be selectively pruned, not balled and shaped for health and safety when the following conditions exist: Remove growth in front of windows, over entrance ways or walks, and any growth which will obstruct vision at street intersections or

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- of security personnel; Remove dead, damaged or diseased branches or limbs; where shrub growth obstructs pedestrian walkways; where shrub growth is found growing against or over structures; where shrub growth permits concealment of unauthorized persons. Dispose of all pruning debris in a proper manner.
4. Tree Maintenance: Tree maintenance must include adjustment of stakes, ties, watering, fertilizing, pest control, mulching, pruning for health and safety and fall leaf cleanup. Fertilize exterior trees to promote healthy plant growth without encouraging excessive top foliar growth. Inspect and adjust stakes, to avoid girdling and promote natural development. All trees within the Project boundaries, regardless of caliper, must be selectively pruned for safety and health reasons. These include but are not limited to removal of dead and broken branches and correction of structural defects. Prune trees according to their natural growth characteristics leaving trees well shaped and balanced. Pruning of all trees must be accomplished by or in the presence of a certified member of the International Society of Arboriculture and in accordance with TCIA Z133. All pruning debris generated must be disposed of in a proper manner.
- a. Mulching: During the establishment period a minimum 3-foot by 3-foot planting area around each tree shall be maintained with a layer of bark mulch two inches to four inches in depth, for all trees not installed in a post-construction stormwater quality facility. The mulch shall be kept at least 2 inches away from the trunk of the tree, and the mulched planting area around the tree shall be kept free of weeds.
- b. Pruning Requirements: Dead, broken, or split branches shall be pruned at the time of planting. Trees shall be pruned to remove branches that are crossing, damaged, diseased, broken, or have included bark. Trees shall not be topped or reduced in height without specific approval of the City Forester. Trees shall be pruned so at least two thirds of the tree's height is canopy with one third of the height being the trunk. The lower limbs shall be pruned off or tipped back to comply with clearance requirements for sidewalks and streets. Initial structural pruning shall be performed at the end of the 3-year establishment period. A strong scaffold branch structure shall be developed by pruning to select the primary scaffold branches. Pruning shall be performed according to the approved urban forestry pruning standards and specifications.

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- c. **Slope Erosion Control Maintenance:** Provide slope erosion control maintenance to prevent undermining of all slopes in newly landscaped and natural growth areas. Maintenance tasks include immediate repairs to weak spots in sloped areas, and maintaining clean, clear culverts, and graded berms, and terraces to intercept and direct water flow to prevent development of large gullies and slope erosion and during periods of extended rainfall, irrigation systems must be secured. Eroded areas must be filled with amended topsoil and replanted with the same plant species. Erosion control netting blankets damaged due to slope erosion must be reinstalled.
5. **Removal of Dying or Dead Plants:** Remove dead and dying plants and provide new plants immediately upon commencement of the specified planting season, and replace stakes, mulch, and eroded earth mound water basins. Provide an additional 90-day establishment period for replacement plants beyond the original warranty period. A tree must be considered dying or dead when the main leader has died back, a minimum of 20 percent of the crown has died, trees have no live growth originating in the scaffolding branches, or trees that have lost a minimum of 50 percent of its total foliage or have a reduction of 50 percent of normal leaf size for that species. A shrub or ground cover must be considered dying or dead when a minimum of 20 percent of the plant has died. This condition must be determined by scraping on a branch an area 1/16-inch square, maximum, to determine the cause for dying plant material and must provide recommendations for replacement. The Contractor must determine the cause for dying plant material and provide recommendations for replacement.
6. **Tracking of Unhealthy Plants:** Note plants not in healthy growing condition, as determined by the City Engineer, and as soon as seasonal conditions permit, remove and replace with plants of the same species and sizes as originally specified. Install replacement plantings in accordance with Section 32 93 00, Plants.
7. **Final Inspection:**
 - a. Final inspection will be made upon written request from the Contractor at least 10 days prior to the last day of the establishment period. Final inspection will be based upon satisfactory health and growth of plants and on the following:
 - 1) **Total Plants on Site:** Plants have been accepted and required number of replacements have been installed.
 - 2) **Mulching and Weeding:** Planter beds and earth mound water basins are properly mulched and free of weeds.
 - 3) **Remedial Work:** Remedial measures directed by the City Engineer to ensure plant material survival and promote healthy growth have been completed.

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8. Unsatisfactory Work: When work is found to not meet design intent and specifications, maintenance period will be extended at no additional cost to the City until work has been completed, inspected, and accepted by City Engineer.

3.05 FIELD QUALITY CONTROL

- A. Monitoring: Approval and acceptance of trees and plantings will be conditioned upon the Contractor providing a monitoring schedule for the purpose of evaluating the health and establishment of all planting. The schedule shall span the entire establishment period; shall identify the responsible party and its contact information; and shall identify the dates of inspection (minimum of three per growing season, evenly spaced, and one prior to onset of growing season) to be performed. The monitoring schedule shall be updated, revised, and resubmitted within 5 working days of any request by the City Engineer.

During the establishment period the Contractor shall provide reporting documents to the City Engineer to demonstrate conformance with the monitoring requirements. Reporting documents shall include the name of the person performing the inspection; date and time; location; and the health and general condition of each size and variety of tree. Complete reporting documents shall be submitted to the City Engineer within 5 working days of each inspection.

- B. Tree Staking Removal: Provide a certified letter that all stakes are removed from all Project trees at the end of the establishment period.

END OF SECTION

SECTION 32 32 24
GRAVITY BLOCK WALL SYSTEM

PART 1 GENERAL

1.01 WORK OF THIS SECTION

- A. This section includes gravity block retaining wall systems consisting of a column of segmental concrete facing units retaining compacted soil backfill and/or a native ground cut.
- B. Work shall consist of furnishing all materials, labor, equipment, field supervision, and installing a gravity block wall system in accordance with given specifications.
- C. All installations should conform to Drawings, profiles, and Specifications for this Project. Construction of the gravity block wall may involve removal and demolition of existing slope and landscaping as shown on the Drawings. Work shall be conducted to minimize excavation into the existing slope.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. American Association of State Highway and Transportation Officials (AASHTO):
 - a. Standard Specification for Highway Bridges, Latest Edition with Interim Specifications, Washington, D.C.
 - b. Standard Specifications for Transportation Materials and Methods of Sampling and Testing, Latest Edition, Washington, D.C., August 1986.
 - 2. ASTM International (ASTM):
 - a. C33, Standard Specification for Concrete Aggregates.
 - b. C150, Standard Specification for Concrete Blocks.
 - c. C260, Standard Specification for Air-Entraining Admixtures for Concrete.
 - d. C494, Standard Specification for Chemical Admixtures for Concrete.
 - e. C805, Standard Test Method for Rebound Number of Hardened Concrete.
 - f. D422, Standard Test Method for Gradation of Soils.

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- g. D1140, Standard Test Methods for Determining the Amount of Material Finer than 75- μ m (No. 200) Sieve in Soils by Washing.
 - h. D1557, Standard Specification for Moisture Density Relationship for Soils, Modified Proctor Method.
3. National Concrete Masonry Association (NCMA): TEK 2-4A, Specification for Segmental Retaining Wall Units.

1.03 DEFINITIONS

- A. Free-draining, well-graded, and coarse-grained aggregates placed immediately behind the blocks to relieve hydrostatic pressures or seepage forces and to prevent clogging of aggregate drainage medium if a geotextile fabric is not used.
- B. Drainage Swale: A small depression adjacent to the top of wall to collect surface water run-off and discharge by gravity flow.
- C. Drainage/Underdrain Pipe: Perforated pipe with adequate flow capacity placed typically at the base of the wall to discharge collected water into suitable receptacle by gravity flow.
- D. Foreslope/Toeslope: Downslope in front of the toe of wall.
- E. Foundation Subgrade: Competent native soil subgrade or compacted structural fill subgrade for supporting the gravity block wall structure as approved by a qualified Geotechnical Engineer.
- F. Geotextile Filter Fabric: A filter fabric (with adequate permittivity or porosity) placed against the retained soil mass or between drainage media and retained soil mass to minimize clogging of drainage media.
- G. Gravity Block Wall Unit: A segmental concrete unit with shear keys generally made of “surplus concrete mix” in the yard of a ready-mix concrete supplier.
- H. Gravity Soil Mass: Compacted structural fill placed immediately behind the wall, which contributes to the gravity mass of the wall structure.
- I. Leveling Pad: Densely compacted and free draining crushed rock (granular fill) pad for distributing the weight of block wall over a wider area and for providing a working surface during construction.
- J. Relative Compaction: Ratio, in percent, of as-compacted field dry density to laboratory maximum dry density as determined in accordance with ASTM D1557. Apply corrections for oversize material to either as-compacted field dry density or maximum dry density, as determined by Engineer.

- K. Retained Soil: Native soils or compacted granular fill situated immediately behind drainage fill. The primary function of the gravity wall is to retain this soil mass without failure.
- L. Retained Backfill: Compacted granular fill placed behind the drainage fill or directly behind the gravity block wall units as outlined on the Drawings.

1.04 SYSTEM DESCRIPTION

- A. Design Requirements: Design the retaining wall system in accordance with the design guidelines presented by the manufacturer of the gravity block wall system. The designer of the gravity block wall system shall be certified and authorized by the manufacturer of the gravity block wall system and shall be a licensed professional engineer in the State of Oregon.
- B. Performance Requirements: The contractors, material suppliers, and wall system suppliers shall have sufficient past project experience and shall be approved by the Engineer as part of submittal.
- C. Wall Design Criteria and Parameters:
 - 1. Design of the gravity block wall system shall be based on the criteria and geotechnical parameters specified below:
 - a. Design calculations shall be based on the recommended procedure by manufacturer of the gravity block wall system. This procedure shall be based on the requirements specified in the 2018 IBC, current AASHTO Standard Specifications for Highway Bridges, including current interims and the National Concrete Masonry Association (NCMA) Design Manual for Segmental Retaining Walls. In the event of conflict, the most stringent of the design requirements shall be used.
 - b. Factors of safety shall be as follows:
 - 1) Sliding: Greater than or equal to 1.5.
 - 2) Overturning: Greater than or equal to 2.0.
 - 3) Bearing Capacity: Greater than or equal to 2.0.
 - 4) Global Stability: Greater than or equal to 1.5.

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c. Geotechnical parameters for design shall be as follows:

Soil Properties	Retained Soil (behind drainage gravel)	Foundation Soil
Unit Weight (pcf)	120	125
Friction Angle (degrees)	32	34
Cohesion (psf)	0	0

d. Allowable bearing pressure for the foundation shall be 3,000 psf (static) and 4,000 psf (seismic). Design for seismic loading shall be based on applicable criteria from the International Building (IBC), 2018.

1.05 SUBMITTALS

- A. Submittals shall be made 15 days prior to the start of construction. In addition, the Contractor shall provide a list of successfully completed projects along with related Project references.
- B. Product Data: Manufacturer’s materials specifications, installation instructions, and general recommendations.
- C. Retaining Wall Plans: Engineering drawings, cross-sections, elevations, and large scale details of elevation, typical sections, details, and connections. Plans shall be stamped and signed by a qualified professional engineer licensed in the State of Oregon.
- D. Quality Control and Certification Submittals: Design calculations and Drawings for the gravity block retaining wall system. All design data shall be stamped by the Designer. The designer shall be a qualified professional engineer licensed in the State of Oregon.

1.06 QUALITY ASSURANCE

- A. Preconstruction Meeting: A meeting between the Geotechnical Engineer, wall designer, Contractor, material supplier, subcontractors, and the Owner shall be held at the Site in order to review the gravity block retaining wall design and construction requirements. A notification shall be sent to all the parties at least 3 days in advance of the time of the meeting.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. At the time of delivery, the Contractor shall inspect and confirm proper type and grade of materials. All product specifications shall be reviewed to assure that all specified materials have been delivered.
- B. The Contractor shall store and handle all materials in accordance with manufacturer's recommendations. The Contractor shall avoid excessive mud, wet concrete, epoxy, or other deleterious materials from coming in contact with and affixing to materials.
- C. The Contractor shall discard all damaged materials and not use them in wall construction.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Base Bid: Stone Terra Ridgestone.
- B. Deductive Alternative 4: UltraBlock Cut Stone.
- C. Deductive Alternative 5: UltraBlock Quarry Stone.
- D. Deductive Alternative 6: Gabions.

2.02 MATERIALS

- A. Gravity Block Wall Segmental Unit:
 - 1. The gravity block wall units shall have 28-day compressive strength of at least 2,200 psi.
 - 2. All individual gravity block wall units shall be free of cracks and other defects that would interfere with the placement and locking of units. Specifically, all shear keys shall be free of any damage.
- B. Granular Drain Material: Crushed, angular gravel, well graded from coarse to fine with maximum 1-inch particle size and maximum 2 percent passing the No. 4 Sieve.
- C. Drainage Pipe: The drainage (underdrain) pipe shall be placed as shown on the Drawings.
- D. Retained Backfill Materials: Retained backfill materials shall consist of compacted earthfill (material from required excavations, free of materials larger than 1-inch, clods, vegetation and debris).

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- E. Leveling Pad Material: leveling pad material shall consist of compacted Granular Fill, minimum 12 inches thick. Granular Fill shall be crushed graded gravel and sand, well graded from coarse to fine with 1-inch maximum particles size and maximum 8 percent passing the No. 200 Sieve.
- F. Geogrid Reinforcement: Materials for geogrid reinforcement shall be as recommended by the wall manufacturer and installed as required by design.

PART 3 EXECUTION

3.01 CONSTRUCTION REQUIREMENTS

- A. General: The wall contractor and the Site Supervisor shall have successfully completed several projects including the installation of gravity block wall system described herein.
- B. Excavation:
 - 1. The Contractor shall provide adequate excavation support during construction in accordance with local, state, and federal safety regulations.
 - 2. It shall be Contractor's responsibility to assure site safety during excavation and other construction activities.
 - 3. The subgrade shall be excavated to meet design requirements shown on grading plans and as specified herein.
 - 4. Excavations shall be made vertically to the plan elevation and horizontally so that over-excavation is minimized. Width of excavation should allow for wall base and underdrain pipe.
 - 5. Start excavation at the lowest wall level. If wall steps up in one block height, the base block should be installed at the lowest level in order to establish grade and face location of the second level.
 - 6. Overexcavated or filled areas shall be well compacted and inspected and approved by a qualified Geotechnical Engineer.
- C. Foundation Preparation:
 - 1. Foundation trench shall be excavated below the frost zone depth and allowance for placement of crushed granular fill.
 - 2. A qualified Geotechnical Engineer shall inspect and approve the reinforced zone and leveling pad foundation soil subgrade in order to ensure adequate bearing capacity. The Geotechnical Engineer may recommend additional testing of the foundation, depending on the nature of the material exposed at the subgrade during excavation. Subgrade soil areas not meeting required bearing strength shall be

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marked in the field and the Contractor shall remove and replace these areas with approved fill materials.

3. Foundation subgrade soils and any backfill materials shall be compacted to a minimum of 95 percent modified proctor maximum dry density and at moisture content within 2 percent of optimum, in accordance with ASTM D1557, before placing the leveling pad.

D. Leveling Pad Installation:

1. The leveling pad shall consist of 12 inches granular fill compacted to 95 percent of ASTM D1557 (modified proctor compaction density).
2. A gravity block wall supplier's representative experienced in the gravity block wall construction shall assist the Contractor regarding leveling pad preparation for achieving specified wall batter. The Engineer shall inspect and approve the leveling pad prior to the placement of blocks.
3. As a minimum, start at the lowest wall level, locate the front face of the wall, run a string about 1 inch in front and 2 inches above the base. Use 2 by 6 or 2 by 8 pieces of wood boards and steel stakes to make a form for achieving design batter. Set front board in line with the string and at base elevation of the wall. Locate and place the back board at a distance equal to the base width of the wall. Set elevation of back board so that design batter can be achieved. Without moving the string line, start leap-frogging the boards in line with the string and move forward along the length of the wall. It is best to prepare the entire leveling pad/base before placing the blocks.

E. Unit/Block Installation: A track-mounted excavator is the ideal equipment for block installation. A wire rigging with swivel hooks, OSHA approved and rated for weight of the blocks can be attached to the excavator and used for lifting, moving, and placing the blocks.

1. The Contractor shall carefully place the first course of gravity block wall units only after the leveling pad has been approved by the Engineer for adequate batter.
2. Block placement should start at the lowest elevation. At the start of the wall, make a line perpendicular to the face of the wall so the first block can be placed square to the wall face.
3. All gravity block wall units shall be placed snugly together (maximum 1/4-inch gap) and parallel to the straight or curved line of the wall face.
4. The gravity block wall units shall be installed free of all protrusions, debris before installing the next course of units.
5. Do not place any more than five to six blocks along the first course before starting on the second course.

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6. At the completion of the placement of each course, a string line shall be pulled to confirm that the wall geometry is being maintained.
 7. All battered wall corners shall be installed and locked per the block manufacturer's recommendation as approved by the Engineer.
- F. Drainage Fill and Drainage Pipe Placement:
1. The gravity block wall units do not require core fill since there are no voids.
 2. The drainage fill shall be placed within an envelope of 12 inches behind the wall and shall consist of a free draining, crushed granular drain material consisting of open graded materials meeting the requirements specified herein.
 3. The drainage pipe (minimum 4-inch diameter) shall be placed immediately behind the wall at the bottom of the wall with a minimum of 1.5 percent gradient to maintain a positive gravity flow as shown or directed on the Drawings.
- G. Retained Backfill Placement:
1. As shown on the Drawings, the retained backfill material shall be placed in maximum lifts of 10 inches and shall be compacted to a minimum 95 percent modified proctor dry density in accordance with ASTM D1557.
 2. Only hand-operated compaction equipment shall be used within 5 feet of the back face of the gravity block wall units. This area shall be compacted to a minimum 90 percent of modified proctor dry density in accordance with ASTM D1557.
 3. In-place soil density testing shall not be performed within 5 feet of the tail of the gravity block wall segmental concrete facing units.
 4. The toe of the wall shall be filled and compacted as the wall is being constructed.
 5. The fill areas shall be graded or protected to drain surface water run-off away from the wall face.
- H. Tolerance: Wall batter tolerance of plus or minus 1/8 inch per foot maximum shall be allowed.

END OF SECTION

SECTION 32 84 23
LANDSCAPE IRRIGATION SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

- A. The Project has two points of connection for irrigation on the Project, separating irrigation for Linear Park and Transition Parkway into two systems. Each of the systems is controlled by a single controller.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Society of Mechanical Engineers (ASME): B16.5, Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24.
 2. ASTM International (ASTM):
 - a. A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - b. A615/A615M, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - c. B32, Standard Specification for Solder Metal.
 - d. B88, Standard Specification for Seamless Copper Water Tube.
 - e. B584, Standard Specification for Copper Alloy Sand Castings for General Applications.
 - f. D1784, Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
 - g. D1785, Standard Specifications for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
 - h. D2241, Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
 - i. D2466, Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
 - j. D2467, Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
 3. National Fire Protection Association (NFPA): NFPA No. 70, National Electrical Code (NEC).

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1.03 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:
 - a. Product Data:
 - 1) Valves and valve access boxes.
 - 2) Controllers, timers.
 - 3) Backflow prevention devices and assemblies.
 - 4) Pipe and fittings.
 - 5) Sprinkler heads.
 - b. Electric Automatic Controllers and Timers: Wiring circuit, parts list, operation manual, and name and location of an in-state central service facility.

B. Informational Submittals:

1. Qualifications:
 - a. System manufacturer.
 - b. System installer.
2. Operation and Maintenance Data.
3. Record Drawings: Completed irrigation system.

1.04 QUALIFICATIONS

- A. System Supplier: Regularly engaged in the production of irrigation systems.
- B. System Installer: Specialist. Minimum of 5 years' previous experience installing systems of complexity and size for similar type projects. Resident representative thoroughly familiar with materials specified for installation and methods of installation to be present onsite and with authority to direct Work under this section throughout its installation.

1.05 EXTRA MATERIALS

- A. Furnish, tag, and box for shipment and storage the following special tools:

<u>Quantity</u>	<u>Item</u>
2 sets	Special wrenches for removal and installation of each type of sprinkler head provided
2	Valve keys for manual operation of valves

PART 2 PRODUCTS

2.01 PIPE BASE MATERIAL

- A. 1/4-inch minus clean sand.

2.02 GRAVEL

- A. 3/4-inch minus, 1/2-inch plus, clean, washed, round gravel.

2.03 PIPE AND FITTINGS

A. Galvanized Steel:

1. Pipe: Standard weight, Schedule 40, ASTM A53/A53M.
2. Fittings: Galvanized, malleable, screwed, in accordance with ASME B16.5.
3. Joint Compounds: Standard for the area and suitable for use with potable water system.

B. Plastic:

1. Pipe: Rigid PVC, Type I, Grade 1, ASTM D1784, ASTM D1785, and ASTM D2241.
 - a. Class 200, SDR 21 when installed with solvent weld fittings.
 - b. Schedule 80, when threaded fittings are used.
2. Fittings:
 - a. Threaded: Type I, Schedule 80, ASTM D2467; Uscolite (U.S. Rubber Co.), Koroseal (B.F. Goodrich), or Kraloy/Chemtrol.
 - b. Solvent Weld: Type I, Schedule 40, ASTM D2466.
3. Joint Material:
 - a. Threaded: Teflon tape or Teflon spray.
 - b. Solvent Weld: Pipe manufacturer's recommendations.

C. Risers to Sprinkler Heads: Schedule 80 PVC.

D. Pipe Under Improved Areas (Curbs, Walks, Pavements): PVC, per plan.

2.04 SLEEVES

- A. Standard weight, Schedule 40 PVC.

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2.05 VALVES

A. Gate Valves:

1. Zone Shutoff Valves 2 Inches and Smaller: Bronze, double disc wedge type with integral taper seats.
2. 2-1/2 Inches and Larger: Iron body, brass trimmed, double disc wedge type with integral taper seats.
3. Service rated (nonshock cold water) at not less than 200 psi. Cast or stamp manufacturer's identification on valve body.

B. Pressure Regulating Valves (PRV):

1. Brass body and trim with cast iron spring and case, Buna-N diaphragm, and threaded connections.
2. Inlet pressure of 100 psi; outlet pressure as shown.
3. Manufacturers and Products:
 - a. Fisher; Type 75A.
 - b. Mueller; Type H-9310.

C. Electric Remote Control Zone Valves:

1. Normally closed type with automatic shutoff in event of power failure.
2. Close or not open in less than 4 seconds.
3. Capable of manual control during power failure.
4. Flow control device: To eliminate effects of flow on opening or closing of valve.
5. Corrosion-resistant metal such as brass, bronze or plastic.
6. Waterproofed for burial.
7. Union for supply line connection.
8. Operation not dependent on pressure loss through valves.
9. Motor assembly removable without disturbing valve body.
10. Power operated by 24-volt ac to 26-1/2-volt ac controller.
11. Include flow control mechanism.
12. UL listed.

D. Quick-Coupling Valves:

1. Allow for attachment of hose swivels and for air blowout of system.
2. Body:
 - a. One-piece or two-piece type with locking cap.
 - b. Heavy-duty brass in accordance with ASTM B584, 81-3-7-9 type, or heavy-duty bronze.
 - c. Cap: Brass, bronze, or other noncorrosive metal.
3. Watertight before and after coupler is inserted.

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4. Mechanism designed so valve seat is closed before coupler is removed.
5. Manufacturer's casting or stamp on valve body.
6. Valve design compatible with valve couplers, keys, and hose swivels.
7. Provide two keys for locking caps.
8. Hose Swivels: 3/4 inch with 90-degree swivel ell, and free turning through a 360-degree swing. Swivel Spindle: Watertight in service. Furnish hose swivels.

E. Drain Valves:

1. Automatic: Spring-loaded type; valve box and cover at each drain valve.
2. Manual: Bronze, brass, or stainless steel, manual angle valve designed so the valve seat rises completely out of the water flow line. Include a heavy-duty standard star handle or notched round handle for easy operation of valve by hand or with long handle valve key.

2.06 MANUAL VALVE OPERATING KEY

- A. One for manual control valves and manual drain valves, 30 inches long, steel rod with all-welded construction and with protective coating.

2.07 VALVE MARKERS

- A. Locking type to be installed in top of 2-inch PVC pipe. Furnish operating keys for valve markers.

2.08 VALVE ACCESS BOXES AND COVERS

- A. Box: Thermoplastic to house remote control, manual control, zone shutoff, gate, automatic drain valves and globe valves that will not be installed with valve markers.
- B. Covers: Thermoplastic locking or hinged covers are not required unless otherwise specified or shown.
- C. Manufacturers and Products:
1. Remote Control Valves 3 Inches and Smaller: Ametek; "Standard" Model.
 2. Adjustable Valve Box for Large Zone Shutoff Valves and Larger Remote Control Valves: Ametek; "Jumbo" Model.

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2.09 PRESSURE GAUGE

- A. 2 Inch, heavy-duty with metal case, equipped with setscrews. Zero to 150 psi range, minimum. Fitted with 1/4-inch iron pipe screwed (IPS) male connection.

2.10 AUTOMATIC CONTROL SYSTEM

- A. General: Furnish low voltage system, UL listed, and manufactured expressly for control of automatic circuit valves of underground irrigation systems. The number and kind of circuit controls is as shown.
- B. Control Enclosure: Manufacturer's standard weatherproof cabinet with locking cover, NFPA No. 70. Furnish manufacturer's recommended pedestal for mounting device where shown.
- C. Transformer: Convert building service voltage to control voltage of 24 volts.
- D. Circuit Control: Each circuit variable from approximately 5 minutes to 60 minutes. Include switch for manual or automatic operation of each circuit with digital display.
- E. Timing Device: Adjustable, 24-hour and 7-day or 14-day clocks to operate any time of day and skip any day in a 7-day or 14-day period.
- F. Allow for manual or semiautomatic operation without disturbing preset automatic operation.

2.11 ELECTRICAL CONDUCTORS AND CONDUIT

- A. Conductors:
 - 1. Power Source to Controller or Timer: Conduit encased copper, minimum size No. 10, Type TW, consisting of two conductors and bare copper ground wire.
 - 2. Controllers or Timers to Valves: Standard copper Type UF irrigation control wire.
 - 3. Wire Sizes: As recommended by automatic control valve manufacturer.
- B. Conduit:
 - 1. Aboveground: Galvanized, rigid steel, electrical type.
 - 2. Underground: Schedule 40 PVC electrical type.

2.12 ELECTRICAL CONNECTORS

A. Manufacturers and Products:

1. 3M; DBY-Direct Bury Splice Kit.
2. Rain Bird; Pen-Tite wire connectors, No. PT 101 through 104.

2.13 SPRINKLERS

- A. Pop-Up Rotary: Gear drive, full circle and part circle type, heavy-duty unit; removable from aboveground; adjustable, as indicated; orifices or nozzles interchangeable.

2.14 VACUUM BREAKERS

- A. Pressure or Atmospheric Type: Bronze body, with machined valve seat; working pressure rating to 150 psi.

B. Pressure Type Assembly:

1. Vacuum breaker.
2. Two gate valves of same size as vacuum breaker.
3. One check valve for 2 inches and smaller or two check valves for 2-1/2 inches and larger; of same size as vacuum breaker.
4. Union and nipples.

2.15 BACKFLOW PREVENTION ASSEMBLIES

- A. Reduced Pressure Backflow Preventer Assembly: Two gate valves, two check valves, and one relief valve; gate valve size equal to preventer size.

- B. Double Check Valve Assembly: Two gate valves and two check valves, of equal size.

2.16 ACCESSORIES

- A. Metal Stakes: Intermediate Grade, new billet steel, deformed, ASTM A615/A615M, Grade 40; or Sta-Stake, manufactured by King Bros. Industries, Sepulveda, CA.

- B. Worm-Gear Clamps: Stainless steel with 3/8-inch wide stainless steel hex head screw.

PART 3 EXECUTION

3.01 TRENCH EXCAVATION, PREPARATION, AND BACKFILL

- A. Areas Receiving Topsoil: Commence irrigation system construction only after topsoil has been spread, compacted, and rough graded.
- B. Excavation: In accordance with City of Albany Construction Specifications Section 204 Excavation, Backfill, and other Site Work.
 - 1. Excavation: Unclassified.
 - 2. Width: Excavate to narrowest practicable.
 - 3. Bottom: Reasonably true to grade and free of protruding stones, roots, and other undesirable material. Uniformly slope to low points.
- C. Backfill: Excavated material from the Site free from roots, organic matter, debris, and other deleterious materials.
 - 1. Pipe Base Material: Place and firmly tamp sand to 2-inch depth to provide continuous solid foundation for pipe.
 - 2. To a point 4 inches above pipe, place and compact excavated material.
 - 3. Place backfill in layers not exceeding 6 inches, thoroughly compact each layer, up to finished grade, except in planting areas.
 - 4. Planting Areas: In accordance with Special Provision Section 32 91 13, Soil Preparation.
 - 5. Smooth up and make clean and free of excess materials and debris those areas disturbed by operations performed under this section.

3.02 INSTALLATION OF PIPE AND FITTINGS

- A. Galvanized Steel Pipe: Threads clean cut and ends reamed and free of burrs and rough edges, apply pipe compound sparingly on male threads only.
- B. Plastic Pipe:
 - 1. Use only strap wrenches on threaded joints.
 - 2. Follow manufacturer's recommendations in use of solvent cement.
 - 3. Do not subject unthreaded pipe joints to hydrostatic pressure for 48 hours after making joints.
 - 4. Lay pipe on the prepared pipe base, snaking pipe from one side of trench to the other to provide for subsequent contraction.
 - 5. Start backfill activities only after successful completion of hydrostatic pressure testing.
- C. Pipe under Improved Areas (Curbs, Walks, Pavements): Install inside sleeves.

D. Copper Tubing:

1. Prevent annealing of fittings when making connections.
2. Do not miter joints for elbows.
3. Do not notch straight runs of pipe for tees.
4. Do not use cored solder.

3.03 SLEEVES

- A. Provide a minimum cover of 36 inches where installed under improved areas.

3.04 INSTALLATION OF VALVES AND VALVE ACCESS BOXES

A. Valves: Install with a union.

1. With Handles: Set at a depth to provide clearance between top of handle and box cover, or sleeve in which placed, when the valve is in open position and the cover is closed.
2. Quick-Coupling: 4 inches above finished grade for flower beds and 12 inches from the edge of lawns, curbs, pavement, or graveled surfaces.

B. Valve Access Boxes and Sleeves: Install on a gravel base to provide foundation, ease of leveling, and proper drainage.

1. Lawn Areas: Set to bring cover flush with finished ground surface.
2. Shrub Areas: Set 2 inches above finished ground.

C. Group manual zone control valves together.

3.05 DRAIN VALVE PITS

A. Pit Excavation and Preparation:

1. Excavate 3 feet below the lowest point of line or system drained.
2. Excavate the pit diameter to contain a minimum 8 cubic feet of rock or gravel.
3. Place 6-mil polyethylene sheeting over the installed rock to prevent infiltration of fines.

B. Drain Valve: Install in center of pit.

C. Provide 2-inch-diameter PVC pipe stacked to ground surface for access to drain valve handle.

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3.06 VACUUM BREAKER ASSEMBLIES

- A. Install each assembly as one unit, complete with gate and check valves, so each assembly extends 6 inches higher than the highest sprinkler head it serves.
 - 1. Atmospheric Type: Install on discharge side of section control valves.
 - 2. Pressure Type: Install in supply side ahead of section control valves and after meter or pump.

3.07 BACKFLOW PREVENTION DEVICES

- A. Install with a union on the discharge side of the assembly, except those with flange type fittings.
- B. Connecting Pipe: Galvanized steel of at least same size as component parts used with the assembly, from supply line to 10 feet beyond the assembly.
- C. Reduced Pressure Backflow Preventer Assembly:
 - 1. Install in the supply line ahead of the section control valves they serve and immediately after the meter or pump.
 - 2. Assemblies may be installed at a lower elevation than the sprinkler heads, but install assembly centerline 2 feet above grade with adequate drainage.
 - 3. Do not place where assembly could be submerged in water.
- D. Double Check Valve: Install in a manner similar to that for the reduced pressure backflow preventer.

3.08 IRRIGATION LINE CLEARANCES

- A. Same Trench: Minimum 6-inch horizontal clearance.
- B. Crossing Lines: Minimum 2-inch vertical clearance.
- C. Other Utilities: Minimum 12-inch clearance in any direction.

3.09 SYSTEM DRAINAGE

- A. Drain Valves: Locate at low points of pipelines so entire system is drained.
- B. Slope line(s) to ensure entire system effectively drained to drain valves.

3.10 AUTOMATIC CONTROLLER AND WIRING

- A. Install in accordance with manufacturer's recommendations and Division 26, Electrical.

3.11 ELECTRICAL CONDUCTORS AND CONDUIT

- A. In accordance with Special Provision Section 26 05 01, Electrical.
- B. Conduit: In accordance with Special Provision Section 26 05 01, Electrical.

3.12 ELECTRICAL CONNECTORS

- A. In accordance with Special Provision Section 26 05 01, Electrical.

3.13 SPRINKLERS

- A. Set perpendicular to finished grade at manufacturer's recommended height.
- B. Variations in arrangement of heads to avoid trees, shrubs, and other obstacles subject to Engineer's prior approval.
- C. Locate minimum 4 inches from walkways, drives, paths, curbs or other paved areas or concrete structures.
- D. Install heads with swing joint assemblies.
- E. Adjusting and Tightening:
 - 1. Adjust sprinklers having adjustable pin nozzles so the pin is directed into the stream for proper water distribution.
 - 2. Tighten nozzles on stationary pop-up sprinklers or stationary heads after installation.
 - 3. Adjust sprinklers having adjusting screw, adjusting stem, or adjusting friction collar on a lateral line or circuit, as necessary for proper coverage and discharge rate.

3.14 FLUSHING

- A. Flush supply lines and laterals as follows:
 - 1. Before installation of valves and fittings.
 - 2. Reflush after installation of valves and fittings.

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3.15 TESTING AND INSPECTION

- A. Do not perform hydrostatic pressure test on solvent welded pipeline and pipe joints for at least 48 hours after installation of zone to be tested.
- B. Test each zone to 125 psi and as follows:
 - 1. Center load sections of pipe as necessary to prevent arching or whipping during testing.
 - 2. Test lateral lines from the section control valves to the sprinkler heads for 1 hour, minimum.
 - 3. Test main lines to section control valves until leak-free for a period of 48 hours.
- C. Remove and replace defective piping, and perform testing until test zone is completely watertight at which time test may be considered successfully completed.

3.16 SYSTEM BALANCING

- A. Adjust and balance the completed system at normal water pressure with fully open valves.

END OF SECTION

**SECTION 32 91 13
SOIL PREPARATION**

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. ASTM International (ASTM):
 - a. C33/C33M, Standard Specification for Concrete Aggregates.
 - b. C602, Standard Specification for Agricultural Liming Materials.
 - c. D2974, Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.
 - d. D5268, Standard Specification for Topsoil Used for Landscaping Purposes.
- B. Refer to Section 601 in Division 6 of the Albany Standard Construction Specifications for growing medium requirements, preparation and placement for swales.

1.02 SUBMITTALS

- A. Action Submittals:
1. Samples: Provide 5 pound representative soil sample of stockpiled topsoil.
 2. Certified Topsoil Analysis Reports:
 - a. Performed by a qualified soils testing laboratory. soils testing laboratories is available from the Oregon State University Extension Service. Include testing for levels of acidity (pH), salinity, nitrates, ammonium, phosphates, potassium, calcium, and magnesium, and any other tests necessary to determine appropriate fertilization and amendment needs for the type of plants being planted.
 - b. Indicate quantities of materials necessary to bring onsite topsoil into compliance with textural/gradation requirements for Planting Soil.
 - c. Indicate quantity of lime, quantity and analysis of fertilizer, and quantity and type of soil additives to bring onsite topsoil into compliance with requirements for Planting Soil.
 3. Certified Compost Analysis Reports:
 - a. Copies of STA lab analysis.
 - b. Copy of DEQ permit or registration of the compost producer.

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1.03 SEQUENCING AND SCHEDULING

- A. Perform Work specified in Albany Standard Construction Specifications Section 203, Clearing and Grubbing, prior to performing Work specified under this section.

PART 2 PRODUCTS

2.01 TOPSOIL

- A. General: Natural, friable, sandy loam, obtained from well-drained areas, free from objects larger than 1-1/2 inches maximum dimension, and free of subsoil, roots, grass, other foreign matter, hazardous or toxic substances, and deleterious material that may be harmful to plant growth or may hinder grading, planting, or maintenance.
- B. Source: Stockpile material onsite, in accordance with Albany Standard Construction Specifications Section 203, Clearing and Grubbing. Import topsoil if onsite material is insufficient in quantity. Provide separate soil testing for imported topsoil and bring into compliance with requirements for Planting Soil.

2.02 GROWING MEDIUM FOR RAIN GARDENS

- A. Refer to Standard Specification Section 601 Growing Medium, for rain garden soil requirements.

2.03 LIME

- A. Composition: Ground limestone with not less than 85 percent total carbonates, ASTM C602.
- B. Gradation:
 - 1. Minimum 50 percent passing No. 100 sieve.
 - 2. Minimum 90 percent passing No. 20 sieve.
 - 3. Coarser material acceptable provided rates of application are increased proportionately on basis of quantities passing No. 100 sieve.

2.04 SOIL ADDITIVES

- A. Compost: For modifying soil structure and improving soil aeration characteristics, as distinguished from plant foods, mulch, and Soil organism amendments. Furnish Soil conditioners free of noxious weeds, living plants and rhizomes, and substances detrimental to plant life. For mushroom compost and peat moss only, submit a 15-pound sample for approval by the Agency prior to construction. Provide soil conditioners that are free of weed seeds, excessive salts, chemicals detrimental to plant growth, and pest organisms. Soil conditioners proposed for use are subject to testing at any time or place the Owner's Representative deems appropriate.
1. Commercially Manufactured Compost:
 - a. Commercially manufactured medium compost meeting the following requirements:
 - 1) Is processed through thermophilic composting meeting the EPA's definition of "Process to Further Reduce Pathogens".
 - 2) Is from a commercial compost facility that holds a current DEQ composting permit or is registered with DEQ as a composting facility.
 - 3) Meets the requirements of the US Composting Council (USCC) and its Seal of Testing Assurance (STA) program.
 - 4) Contains a minimum 65 percent by volume of the following recycled plant waste:
 - a) Source-separated yard and garden wastes.
 - b) Wood wastes.
 - c) Agricultural crop residues.
 - d) Wax-coated cardboard.
 - e) Preconsumer vegetative food wastes.
 - f) Other similar source-separated materials that the DEQ has determined to have a comparable low level of risk in hazardous substances, human pathogens, and physical contaminants.
 - g) Manure or biosolids based composts when approved.

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5) Meets the following compost particle size and media parameters:

a) Compost Particle Size:

COMPOST TYPE			
SIEVE SIZE	FINE*	MEDIUM*	COARSE**
PERCENT PASSING (BY DRY WEIGHT)			
3"	100	100	100
1"	99 - 100	95 - 100	90 - 100
3/4"	99 - 100	95 - 100	70 - 100
5/8"	95 - 100	90 - 100	70 - 100
1/2"	80 - 100	70 - 100	60 - 100
1/4"	75 - 100	70 - 90	30 - 60
*maximum 3-inch particle length			
**maximum 6-inch particle length			

b) Media Parameters:

TEST	REQUIREMENTS
Physical Contaminants*	Less Than 1%
Organic Matter	35% (minimum)
Ph	6.0 To 8.5
Soluble Salt Concentration	5 Ds/M (maximum)
Stability	≤8
Maturity	80% or greater
Moisture Content	35-60% (wet weight)

B. Fertilizer:

1. Natural:

a. Manure:

- 1) Well-rotted, stable or cattle manure, free from weed seed and refuse.
- 2) Maximum 50 percent sawdust or shavings by volume.
- 3) Age: Minimum 4 months; maximum 2 years.

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2. Commercial:
 - a. Commercial, uniform in composition, free-flowing, suitable for application with equipment designed for that purpose.
 - b. Contain the following minimum percentage of plant food by weight:
 - 1) Summer Mix:
 - a) Nitrogen: 20 percent.
 - b) Phosphoric Acid: 10 percent.
 - c) Potash: 10 percent.
 - 2) Winter Mix:
 - a) Nitrogen: 16 percent.
 - b) Phosphoric Acid: 8 percent.
 - c) Potash: 0 percent.

C. Soil Amendments:

1. Soil amendments are intended to improve soil nutrition. Furnish soil amendments that are free of materials detrimental to plant life. Ensure that material testing methods meet the requirements of the Oregon Department of Agriculture appropriate to that material. Obtain approval for use before beginning Work. Soil amendments may include the following:
 - a. Lime:
 - 1) Composition: Ground limestone with not less than 85 percent total carbonates, ASTM C602.
 - 2) Gradation:
 - a) Minimum 50 percent passing No. 100 sieve.
 - b) Minimum 90 percent passing No. 20 sieve.
 - c) Coarser material acceptable provided rates of application are increased proportionately on basis of quantities passing No. 100 sieve.
 - b. Gypsum.
 - c. Rock, diammonia, or other phosphate.
 - d. Calcium or potassium nitrate.
 - e. Iron sulfate.

D. Sand:

1. Fine Aggregate: Clean, coarse, well-graded, ASTM C33/C33M.

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2.05 SOIL STERILANT

- A. Granular Calcium Cyanamide: Herbicide, manufactured by American Cyanamide Co.
- B. Vapam.

2.06 SOURCE QUALITY CONTROL

- A. Topsoil Analysis/Testing: Performed by county or state soil testing service or approved certified independent testing laboratory.

PART 3 EXECUTION

3.01 STORMWATER QUALITY FACILITIES

- A. Soils and soil placement for Stormwater Quality Facilities are to be in accordance with Section 601 Growing Medium of the Albany Standard Specifications.

3.02 SUBGRADE PREPARATION

- A. Apply lime at the rate of 50 pounds per 1,000 square feet to subgrade before tilling.
- B. Scarify subgrade to minimum depth of 6 inches where topsoil is to be placed.
- C. Remove stones over 2-1/2 inches in any dimension, sticks, roots, rubbish, and other extraneous material.
- D. Limit preparation to areas which will receive topsoil within 2 days after preparation.

3.03 TOPSOIL PLACEMENT

- A. Do not place topsoil when subsoil or topsoil is frozen, excessively wet, or otherwise detrimental to the Work.
- B. All planting areas shall be weed free before planting or seeding operations begin.
- C. Loosen subgrade soils to a depth of 10 inches to 12 inches. Decompaction shall be clean tillage through fracturing and loosening the soil.

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- D. Place one-half of the total depth of topsoil and work into top 4 inches of subgrade soil to create a transition layer. Place remainder of topsoil to depth of 6 inches where seeding is scheduled and 18 inches in shrub and groundcover beds.
- E. Mix soil amendments, lime, and other soil additives, identified in analysis reports before placement of Topsoil or spread on topsoil surface and mix thoroughly into entire depth of topsoil before planting or seeding. Delay mixing of fertilizer if planting or seeding will not occur within 3 days.
- F. Uniformly distribute to within 1/2 inch of final grades. Fine grade topsoil eliminating rough or low areas and maintaining levels, profiles, and contours of subgrade.
- G. Remove stones exceeding 1-1/2-inch diameter, roots, sticks, debris, and foreign matter during and after topsoil placement.
- H. Remove surplus subsoil and topsoil from Site. Grade stockpile area as necessary and place in condition acceptable for planting or seeding.

END OF SECTION

**SECTION 32 92 00
TURF AND GRASSES**

PART 1 GENERAL

1.01 DEFINITIONS

- A. Maintenance Period: Begin maintenance immediately after each area is planted (seed) and continue for a period of 2 years after all planting under this section is completed.
- B. Satisfactory Stand:
 - 1. Lawn and grass or section of lawn and grass of 10,000 square feet or larger that has:
 - a. No bare spots larger than 3 square feet.
 - b. Not more than 10 percent of total area with bare spots larger than 1 square foot.
 - c. Not more than 15 percent of total area with bare spots larger than 6 square inches.

1.02 SUBMITTALS

- A. Action Submittals: Product labels/data sheets.
- B. Informational Submittals:
 - 1. Seed: Certification of seed analysis, germination rate, and inoculation:
 - a. Certify that each lot of seed has been tested by a testing laboratory certified in seed testing, within 6 months of date of delivery. Include with certification:
 - 1) Name and address of laboratory.
 - 2) Date of test.
 - 3) Lot number for each seed specified.
 - 4) Test Results: (i) name, (ii) percentages of purity and of germination, and (iii) weed content for each kind of seed furnished.
 - b. Mixtures: Proportions of each kind of seed.
 - 2. Seed Inoculant Certification: Bacteria prepared specifically for legume species to be inoculated.
 - 3. Description of required maintenance activities and activity frequency.

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1.03 DELIVERY, STORAGE, AND PROTECTION

- A. Seed:
 - 1. Furnish in standard containers with seed name, lot number, net weight, percentages of purity, germination, and hard seed and maximum weed seed content, clearly marked for each container of seed.
 - 2. Keep dry during storage.
- B. Hydroseeding Mulch: Mark package of wood fiber mulch to show air dry weight.

1.04 WEATHER RESTRICTIONS

- A. Perform Work under favorable weather and soil moisture conditions as determined by accepted local practice.

1.05 SEQUENCING AND SCHEDULING

- A. Complete Work specified in Section 32 93 00, Plants, and prepare topsoil as specified in Section 32 91 13, Soil Preparation, before starting Work of this section.
- B. Complete Work under this section within 3 days following completion of soil preparation.
- C. Notify Engineer at least 3 days in advance of:
 - 1. Each material delivery.
 - 2. Start of planting activity.
- D. Planting Season: Between March 15 through May 15 and September 1 through October 31.

1.06 MAINTENANCE SERVICE

- A. Contractor:
 - 1. Perform maintenance operations during maintenance period to include:
 - a. Watering: Keep surface moist.
 - b. Washouts: Repair by filling with topsoil, liming, fertilizing, seeding, and mulching.

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- c. Mulch: Replace wherever and whenever washed or blown away.
- d. Mowing: Mow to 2 inches after grass height reaches 3 inches, and mow to maintain grass height from exceeding 3-1/2 inches.
- e. Reseed unsatisfactory areas or portions thereof immediately at the end of the maintenance period if a satisfactory stand has not been produced.
- f. Reseed/replant during next planting season if scheduled end of maintenance period falls after May 15 or October 31.
- g. Reseed/replant entire area if satisfactory stand does not develop by July 1 of the following year.

PART 2 PRODUCTS

2.01 FERTILIZER

- A. Commercial, uniform in composition, free-flowing, suitable for application with equipment designed for that purpose. Minimum percentage of plant food by weight.
- B. Application Rates: Determined by soil analysis results.
- C. Mix:
 - 1. Nitrogen: 10.
 - 2. Phosphoric Acid: 10.
 - 3. Potash: 10.
 - 4. Bonemeal: Commercial, raw, finely ground, with minimum analysis of 4 percent nitrogen and 20 percent phosphoric acid.
- D. Top Dress Type: As recommended by local authority.

2.02 SEED

- A. Fresh, clean new-crop seed that complies with the tolerance for purity and germination established by Official Seed Analysts of North America.
- B. Seeds of Legumes: Inoculated with pure culture of nitrogen-fixing bacteria prepared specifically for legume species in accordance with inoculant manufacturer's instructions.

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- C. Seed mix for Turf Grass Seeding as shown on the Drawings shall be DOT Multipurpose seed mix by Sunmark Seeds, “or-equal”:

Species		Proportion By Weight (Lbs. PLS by Acre)
Lolium perenne var Blazer 4	Blazer 4 Perennial Rye	90
Lolium perenne var Express II	Express II Perennial Rye	90
Festuca rubra spp. fallax var Windward	Windward Chewings Fescue	60
Festuca rubra var. Garnet	Garnet Creeping Red Fescue	60

- D. Seed mix for Drainage Ditch Seeding – Turf areas as shown on the Drawings shall be Supreme Plus seed mix by Sunmark Seeds, “or-equal”:

Species		Proportion By Weight (Lbs. PLS by Acre)
Schedonorus arundinacea	Turf Type Tall Fescue	70
Lolium perenne	Perennial Ryegrass	53
Festuca rubra	Creeping Red Fescue	44
Agrostis capillaris var highland	Highland Colonial Bentgrass	9

- E. Seed mix for Drainage Ditch Seeding – Natives areas as shown on the Drawings shall be Native E/C seed mix by Sunmark Seeds, “or-equal”:

Species		Proportion By Weight (Lbs. PLS by Acre)
Hordeum brachyantherum	Meadow Barley	25
Danthonia californica	California Oatgrass	15
Elymus glaucus	Blue Wild Rye	10

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Species		Proportion By Weight (Lbs. PLS by Acre)
Bromus carinatus	California Brome	10
Festuca romerii	Roemer's Fescue	10
Deschampsia cespitosa	Tufted hairgrass	10
Agrostis exarata	Spike bentgrass	10
Alopecurus geniculatus	Water foxtail	5
Deschampsia elongate	Slender hairgrass	5

- F. Seed mix for Erosion Control Seeding areas as shown on the Drawings shall be Native E/C seed mix by Sunmark Seeds, "or-equal":

Species		Proportion By Weight (Lbs. PLS by Acre)
Hordeum brachyantherum	Meadow Barley	18
Bromus carinatus	California Brome	15
Festuca rubra	Native Red Fescue	9
Deschampsia cespitosa	Tufted Hairgrass	1
Agrostis exerata	Spike Bentgrass	1

2.03 HYDROSEEDING MULCH

- A. Wood Cellulose Fiber Mulch:

1. Specially processed wood fiber containing no growth or germination inhibiting factors.
2. Dyed a suitable color to facilitate inspection of material placement.
3. Manufactured such that after addition and agitation in slurry tanks with water, the material fibers will become uniformly suspended to form homogenous slurry.
4. When hydraulically sprayed on ground, material will allow absorption and percolation of moisture.

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2.04 TACKIFIER

- A. Derived from natural organic plant sources containing no growth or germination-inhibiting materials.
 - 1. Capable of hydrating in water, and to readily blend with other slurry materials.
 - 2. Wood Cellulose Fiber: Add as tracer, at rate of 150 pounds per acre.
 - 3. Manufacturers and Products:
 - a. Chevron Asphalt Co.; CSS 1.
 - b. Terra; Tack AR.
 - c. J Tack; Reclamare.

PART 3 EXECUTION

3.01 PREPARATION

- A. Grade areas to smooth, even surface with loose, uniformly fine texture.
 - 1. Roll and rake, remove ridges, fill depressions to meet finish grades.
 - 2. Limit such Work to areas to be planted within immediate future.
 - 3. Remove debris, and stones larger than 1-1/2-inch diameter, and other objects that may interfere with planting and maintenance operations.
- B. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface to dry off before seeding. Do not create muddy soil.
- C. Restore prepared areas to specified condition if eroded or otherwise disturbed after preparation and before planting.

3.02 FERTILIZER

- A. Apply evenly over area in accordance with manufacturer's instructions. Mix into top 2 inches of topsoil, when applied by broad cast method.
- B. Application Rate: 23 pounds per 1,000 square feet (1,000 pounds per acre).

3.03 SEEDING

- A. Start within 2 days of preparation completion.
- B. Hydroseed slopes steeper than 3H:1V. Flatter slopes may be mechanically seeded.

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- C. Mechanical: Broadcast seed in two different directions, compact seeded area with cultipacter or roller.
 - 1. Sow seed at uniform rate as specified.
 - 2. Use Brillion type seeder.
 - 3. Broadcasting will be allowed only in areas too small to use Brillion type seeder. Where seed is broadcast, increase seeding rate 20 percent.
 - 4. Roll with ring roller to cover seed, and water with fine spray.

- D. Hydroseeding:
 - 1. Application Rate: as specified.
 - 2. Apply on moist soil, only after free surface water has drained away.
 - 3. Prevent drift and displacement of mixture into other areas.
 - 4. Upon application, allow absorption and percolation of moisture into ground.
 - 5. Mixtures: Seed and fertilizer may be mixed together, apply within 30 minutes of mixing to prevent fertilizer from burning seed.

- E. Mulching: Apply uniform cover of hydroseeding mulch at rate of 1,500 pounds per acre.

- F. Tackifier: Apply over all mulched areas at rate of 5 gallons per 1,000 square feet in accordance with the manufacturers recommended requirements.

- G. Water: Apply with fine spray after mulching to saturate top 4 inches of soil.

3.04 FIELD QUALITY CONTROL

- A. Eight weeks after seeding is complete and on written notice from Contractor, Engineer will, within 15 days of receipt, determine if a satisfactory stand has been established.

- B. If a satisfactory stand has not been established, Engineer will make another determination after written notice from Contractor following the next growing season.

- C. See Section 32 05 33, Landscape Establishment.

END OF SECTION

**SECTION 32 93 00
PLANTS**

PART 1 GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. American Association of Nurserymen (AAN): Z60.1, Nursery Stock.
2. Federal Housing Administration (FHA), Section 1103-103.
3. Hortus Third, Liberty Hyde Bailey, Hortorium, 1976.

1.02 DEFINITIONS

A. Measurement:

1. In size grading Balled and Burlapped (B & B), caliper takes precedence over height.
2. Take trunk caliper 6 inches above the ground level (up to and including 4-inch caliper size) and 12 inches above the ground level for larger trees.
3. Measure size of container-grown stock by height and width of plant.
4. Measure herbaceous perennials pot size, not top growth.

1.03 SUBMITTALS

A. Action Submittals:

1. Plant materials source list.
2. Product data on manufactured products specified.
3. Photos of boulders taken at rock yard and representative samples.
4. Stone Mulch Sample: 1 cubic foot.
5. Wall rock and columnar basalt boulder samples.

B. Informational Submittals:

1. Soil percolation test results.
2. Operation and Maintenance Data: Instructions for storage, planting, care, and maintenance of each type of plant for 1-year period in climate and location of the Project.
3. Special guarantee.

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1.04 DELIVERY, STORAGE, AND HANDLING

- A. Cover plants during shipment with a tarpaulin or other suitable covering to minimize drying.
- B. Balled and Burlapped Plants: Wrap each ball firmly with burlap and securely bind with twine, cord, or wire for shipment and handling. Drum-lace balls with a diameter of 30 inches or more.
- C. As specified herein for transplanting.

1.05 SPECIAL GUARANTEE

- A. Provide extended guarantee or warranty and plant establishment in accordance with Section 210.08.00, Establishment Period of the Albany Standard Specifications, supplemental Specification Section 32 05 33, Landscape Establishment, and per below.
- B. Replace defective plants with new plants free of dead or dying branches and branch tips, and bearing foliage of a normal density, size, and color. Closely match new plants to adjacent specimens of the same species and meet requirements of this Specification.
- C. Plant replacement plants that die during a season unfavorable for planting during first month of next favorable planting season.
- D. Plants damaged or lost due to Project (or any part thereof) occupancy, vandalism, or acts of neglect by others are not subject to this special guarantee.

1.06 MAINTENANCE

- A. Commence to maintain plant life immediately after planting and maintain for a minimum of 2 years, and until plants are well established and exhibit a vigorous growing condition through special guarantee period in accordance with Section 210.08.00, Establishment Responsibilities, of the Albany Standard Specifications and per below.
- B. In accordance with accepted Submittal on care and maintenance of plants and as follows:
 - 1. Maintain by watering, pruning, cultivating, and weeding as required for healthy growth. Restore planting saucers.
 - 2. Tighten and repair stake and guy supports, and reset trees and shrubs to proper grades or vertical position as required.

3. Restore or replace damaged wrappings. Spray as required to keep trees and shrubs free of insects and disease.
4. Removing dead trees or trees not showing vigorous growth, and replacing missing or damaged plants.
5. Remove guys, stakes, and other supports at end of maintenance service.
6. Maintenance includes temporary protection fences, barriers, and signs as required for protection.
7. Coordinate watering to provide deep root watering to newly installed trees.

1.07 SCHEDULING AND SEQUENCING

- A. Plant Deliveries: Notify Engineer at least 3 days in advance of each delivery.
- B. Planting Season: Plant only between September 1 and May 15.
- C. Plant trees and shrubs after final grades are established and before planting of lawns or grasses.

PART 2 PRODUCTS

2.01 PLANT MATERIALS

- A. Provide quantity, size, genus, species, and variety of trees and shrubs indicated; comply with applicable requirements of AAN Z60.1.
- B. Nomenclature (Names of Plants): In accordance with “Hortus Third.”
- C. Quality and Size:
 1. Nursery-grown, habit of growth normal for species.
 2. Sound, healthy, vigorous, and free from insects, diseases, and injuries.
 3. Equal to or exceeding measurements specified in plant list. Measure plants before pruning with branches in normal position.
 4. Root System of Container-Grown Plants: Well developed and well distributed throughout the container, such that the roots visibly extend to the inside face of the growing container.
 5. Perform necessary pruning at time of planting.
 6. Sizes: Dimensional relationship requirements of AAN Z60.1 for kind and type of plants required.
 7. Balled and Burlapped Plants: Firm, intact ball of earth encompassing enough of the fibrous and feeding root system to enable full plant recovery.
 - a. Ball Size: AAN Z60.1.

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8. Container-Grown Plants: Self-established root systems, sufficient to hold earth together after removal from container, without being root bound.
 - a. Stock: Grown in delivery containers for at least 6 months but not over 2 years.
9. Label each tree and shrub of each variety with securely attached waterproof tag bearing legible designation of botanical and common name.

D. Plant List: On the Drawings.

E. Replacement Shrubs and Trees: Same species, size, and quality as specified for plant being replaced.

2.02 ANTIDESICCANT

A. Provide transpiration retarding material to be used where any plant material is moved during the growing season.

B. Products:

1. Foliguard.
2. Wiltpruf.

2.03 GUYING, STAKING, AND WRAPPING MATERIALS

A. Wood Stake: 2 inches by 2 inches by 8 feet.

B. Tree Ties: No. 4 chainlock tree ties as manufactured by Green Brothers, Ltd.

C. Guy Wires: Galvanized, 12-gauge, ductile steel.

D. Flags:

1. Wood: 1/2 inch by 3 inches by 12 inches, with 3/8-inch hole centered 1-1/2 inches from each end, painted white.
2. Sheet Metal: 1-1/2 inch with clipped corners and both ends punched, painted white.

E. Hose: Two-ply, reinforced rubber garden hose, not less than 1/2-inch diameter, new or used.

F. Turnbuckles: Zinc-coated, with 6-1/2-inch lengthwise opening, and at each end 3/8-inch diameter threaded openings fitted with screw eyes.

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- G. Wrapping Material: Heavy crepe paper.
 - 1. Burlap: Of first quality, minimum 8 ounces in weight, not less than 6 inches nor more than 10 inches in width.
- H. Deadmen: 6 inches by 6 inches by 3 feet long pressure treated timbers.

2.04 MULCH

- A. Free from noxious weed seed and foreign material harmful to plant growth.
- B. Barkdust: Medium grind, fir or hemlock; maximum 3/4-inch particle size.
- C. Stone Mulch:
 - 1. Round river rock, washed, with no fines.
 - 2. Stone Size: Minimum 1 inch; maximum 3 inches.
 - 3. Stone that is locally available and color that is natural gray and tans.

2.05 BOULDERS

- A. Composition of boulders shall be native basalt rock indicative of the region.
 - 1. Boulder sizes shall vary from 2-foot diameter to 4-foot diameter in the quantities and size distribution as indicated on the Drawings.

2.06 HERBICIDE

- A. Selective, pre-emergent, surface-applied.
- B. Manufacturers and Products:
 - 1. Eli Lilly and Co.; Surflan.
 - 2. Thompson-Hayward Chemical Co.; Casoron.

2.07 PLANTING SOIL MIX

- A. Planting Soil Mix shall be four parts by volume of topsoil mixed with one part compost per Section 32 91 13, Soil Preparation.

2.08 FERTILIZER

- A. Organic, Slow Release, Mix by Volume:
 - 1. Fishmeal or Seedmeal: 4 parts.
 - 2. Agricultural Lime or Dolomite: 1 part; passing No. 65 screen or finer.

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3. Rock Phosphate: 1 part; or
 - a. Bonemeal: 1/2 part.
4. Kelpmeal: 1/2 part.

2.09 SOURCE QUALITY CONTROL

- A. Top Soil Analysis/Testing: As specified in Section 32 91 13, Soil Preparation.

PART 3 EXECUTION

3.01 PERCOLATION TESTS

- A. Perform to determine subsoil drainage in planting areas by licensed engineer according to method specified in Minimum Property Standards For One-Unit and Two-Unit Dwellings, FHA Section 1103-103.
- B. Test Hole Depth: 30 inches.

3.02 LOCATION OF PLANTS

- A. Locate new planting or stake positions as shown, unless obstructions are encountered, in which case notify Engineer.
- B. Locate no planting, except ground cover, closer than 18 inches to pavements, pedestrian pathways, and structures.
- C. Request Engineer observe locations and adjust as necessary before planting begins.

3.03 PREPARATION

- A. Subsoil Drainage: Furnish for plant pits and beds.
- B. Planting Soil: Delay mixing of amendments and fertilizer if planting will not follow preparation of planting soil within 2 days. For pit and trench type backfill, mix planting soil prior to backfilling and stockpile at Site.
- C. Plants: Place on undisturbed existing soil or well-compacted backfill.
- D. Trees and Shrubs:
 1. Pits, Beds, and Trenches: Excavate with vertical and scarified sides.
 2. B & B Trees and Shrubs: Make excavations at least twice as wide as root ball.

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3. Container-Grown Stock: Excavate as specified for B & B stock, adjust for size of container width and depth.
4. Fill excavations with water and allow to percolate out prior to planting.

E. Ground Cover Beds:

1. Mix amendments and fertilizer with top soil prior to placing or apply on surface of top soil and mix thoroughly before planting.
2. Scarify top soil to a depth of 4 inches to 6 inches.
3. Establish finish grading of soil. Rake areas to smooth and create uniform texture and fill depressions.
4. Moisten.

3.04 PLANTING

- A. Plant trees before planting surrounding smaller shrubs and ground covers. Adjust plants with most desirable side facing toward the prominent view (sidewalk, building, street).
- B. B & B Plants: Place in pit by lifting and carrying by its ball (do not lift by branches or trunk). Lower into pit. Set straight and in pit center with tip of rootball 1 inch to 2 inches above adjacent finish grade.
- C. Container-Grown Plants: Remove containers, slash edges of rootballs from top to bottom at least 1-inch deep. Plant as for B & B plants.
- D. Ground Covers: Dig planting holes through mulch with one of the following: hand trowel, shovel, bulb planter, or hoe. Split biodegradable pots or remove nonbiodegradable pots. Root systems of all potted plants shall be split or crumbled. Plant so roots are surrounded by soil below the mulch. Set potted plants so pot top is even with existing grade.

3.05 BACKFILLING

- A. Backfill with planting soil.
- B. B & B Plants:
 1. Partially backfill pit to support plant. Remove burlap and binding from sides and tops of B & B plants, do not pull burlap from under balls.
 2. Lightly tamp soil around the root ball in 6-inch lifts. Do not over compact.

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3. When excavation is approximately 2/3 full, water thoroughly before placing remainder of backfill to eliminate air pockets and future settling, even if it is raining. Finish backfilling pit sides.
4. Never cover top of rootball with soil. Form a saucer above existing grade, completely around the outer rim of the plant pit.

3.06 GUYING, STAKING, AND WRAPPING

- A. Support trees immediately after planting to maintain plumb position.
- B. Guying: Support deciduous trees over 4 inches in caliper and all coniferous trees with three guys equally.
- C. Staking: Support deciduous trees 4 inches in caliper or less with stakes spaced equally about each tree.
- D. Wrapping: Spirally wrap trunks of deciduous trees from ground line to height of second branches, promptly after planting. Wrap neatly and snug. Hold material in place with raffia cord at top and bottom.

3.07 FERTILIZER

- A. Add as top dressing depending on plant size and manufacturer's recommendation.
- B. Organic:
 1. Trees and Shrubs: Spread within planting saucer, 1/2 cup per caliper inch on trees and 1 cup per 5-gallon volume of container on shrubs.
 2. Ground Cover: According to manufacturer's recommendations.

3.08 MULCHING

- A. Bark Mulch: Cover planting beds and area of saucer around each plant with 3-inch thick layer of Bark mulch within 2 days after planting. Saturate planting area with water. Bark mulch saucer around trees in lawn and stone mulch areas shall be a minimum diameter of 3 feet.
- B. Stone Mulch: Place stone mulch to 6-inch depth as shown on the Drawings.

3.09 BOULDERS

- A. Place boulders as shown on the Drawings.

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3.10 PRUNING AND REPAIR

- A. Prune only after planting and in accordance with standard horticultural practice to preserve natural character of the plant. Perform in presence of Engineer. Remove all dead wood, suckers, and broken or badly bruised branches. Use only clean, sharp tools. Do not cut lead shoot.

3.11 WEED CONTROL

- A. Maintain a weed-free condition within planting areas. Apply pre-emergent selective herbicide to mulched beds at manufacturer's recommended rate of application.

3.12 PROTECTION OF INSTALLED WORK

- A. Protect planting areas and plants against damage for duration of maintenance period.

END OF SECTION

SECTION 33 05 01.10
HIGH-DENSITY POLYETHYLENE (HDPE)
PRESSURE PIPE AND FITTINGS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards that may be referenced in this section:
1. American Society of Mechanical Engineers (ASME):
 - a. Boiler and Pressure Vessel Code, Section IX, Article XXI-XXIV.
 - b. B16.1, Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
 - c. B18.2.1, Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series).
 - d. B18.2.2, Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series).
 2. American Water Works Association (AWWA):
 - a. C906, Polyethylene (PE) Pressure Piping and Fittings, 4 in. through 65 in. for Waterworks.
 - b. Manual M55, PE Pipe - Design and Installation.
 3. ASTM International (ASTM):
 - a. A193/A193M, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications.
 - b. A194/A194M, Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
 - c. A240/A240M, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
 - d. A307, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.
 - e. A536, Standard Specification for Ductile Iron Castings.
 - f. A563, Standard Specification for Carbon and Alloy Steel Nuts.
 - g. D3035, Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
 - h. D3261, Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.

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- i. D3350, Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
- j. F714, Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter.
- k. F2164, Standard Practice for Field Leak Testing of Polyethylene (PE) and Crosslinked Polyethylene (PEX) Pressure Piping Systems Using Hydrostatic Pressure.
- l. F2620, Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings.
4. Code of Federal Regulations (CFR): Title 49 Part 192.285, Plastic Pipe: Qualifying Persons to Make Joints.
5. NSF International (NSF): 61, Drinking Water System Components-Health Effects.
6. Plastics Pipe Institute (PPI):
 - a. Handbook of PE Pipe.
 - b. Technical Note 38, Bolt Torque for Polyethylene Flanged Joints.
 - c. TR-33, Generic Butt Fusion Joining Procedure for Field Joining of Polyethylene Pipe.

1.02 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:
 - a. Catalog information confirming pipe, fittings, and other materials conform to requirements of this section.
 - b. Drawings of specific connection details.

B. Informational Submittals:

1. Manufacturer's Certificate of Compliance.
2. Infrared temperature gun product data.
3. Certificates of qualification for persons to be fusing HDPE pipe.
4. Information on manufacturer and model of machine to be used for fusion of HDPE pipe.
5. Testing Plan:
 - a. Submit at least 15 days prior to testing and include the following as a minimum:
 - 1) Testing dates.
 - 2) Piping systems and section(s) to be tested.
 - 3) Method of isolation.
 - 4) Method of conveying water from source to system being tested.

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6. Certifications of Calibration: Approved testing laboratory certificate if pressure gauge for hydrostatic test has been previously used. If pressure gauge is new, no certificate is required.
7. Proposed locations of electrofusion couplings.
8. Test report documentation.
9. Installation Plan following the Plastic Pipe Institute, ASTM F2620, and manufacturer's recommendations. Plan shall include, but not be limited to the following major components:
 - a. Pipe and fitting storage.
 - b. Pipe and fitting handling equipment.
 - c. Proposed means to maintain required temperatures for fusing.
 - d. Proposed means to shield fusing area from wind, snow, blowing dust, and rain.
 - e. Proposed means to maintain uniform pipe wall temperature prior to fusing.
 - f. Temperature Control Plan: Plan shall include means to reduce temperature of pipe to limit stated in Part 3 of this section.
10. Fusion parameters including recommended limits of criteria recorded by data logger.
11. Fusion report for each joint, including information listed under Article Field Quality Control. Submit joint reports within 24 hours after fusion. Data to be submitted in electronic format.
12. Gasket manufacturer's table for recommended bolt torque and tightening pattern.

1.03 QUALITY ASSURANCE

A. Qualifications:

1. Pipe Manufacturer: Listed with Plastic Pipe Institute.
2. Experienced in fabricating pipe of similar diameters and wall thickness required for the Work.
3. Successful fabrication of at least 5,000 linear feet of 18-inch diameter or larger pipe within past 5-year period.
4. Persons fusing HDPE pipe shall have a current operator qualification training certificate and wallet card showing operator is qualified to operate machine to be used on the Project and have minimum of 1 year of experience with fusing HDPE pipe and have received minimum of 20 hours training for fusing HDPE pipe from pipe supplier or fusing equipment supplier.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Shipping: Do not cut, kink, or otherwise damage pipe during transportation.

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B. Storage and Handling:

1. Pipe interiors are to be inspected and all debris removed prior to storage.
2. Limit stacking of pipe to a height that will not cause excessive deformation of bottom layers of pipes under anticipated temperature conditions.
3. Do not exceed the stacking heights stated in AWWA Manual M55.
4. Where necessary, because of ground conditions, store pipe on wooden sleepers, spaced suitably and of such widths as not to allow deformation of pipe at point of contact with sleeper or between supports.
5. Comply with the requirements of the approved Installation Plan.
6. Keep pipe shaded from direct sunlight prior to fusion and installation in trench.

1.05 CONNECTIONS TO EXISTING PIPE

- A. Fusing to Existing HDPE Pipe: Comply with manufacturer's or distributor's recommendations based on Site conditions and PPI TR-33.

PART 2 PRODUCTS

2.01 MATERIALS

A. Pipe and Fittings:

1. Conform to requirements of AWWA C906.
2. In compliance with NSF 61.
3. Resin:
 - a. Potable Water Transmission and Distribution Systems: Polyethylene resin shall meet or exceed requirements of ASTM D3350 for PE 4710 material with cell classification of 445474C, or better. PE 4710 HDPE pipe and fittings shall be manufactured from bimodal resins. Pressure rating shall be based on hydrostatic design stress of 1,000 psi at 73.4 degrees F.
4. Minimum Pressure Rating: 125 psi.
5. Dimension Ratio (DR): 17, unless otherwise shown.
6. Outside Diameter Basis: IPS.
7. Pipe lengths, fittings, and flanged connections to be joined by thermal butt-fusion shall be of a compatible resin mix for the fusion process.
8. Fittings:
 - a. Polyethylene fittings shall have same or higher pressure rating as pipe.
 - b. Sizes 12 Inches and Smaller: Molded and manufactured to requirements of ASTM D3261.

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- c. Sizes Larger than 12 Inches: Thermal butt-fused fabricated.
- d. Unless noted otherwise, provide fittings with a factory fused 4-foot-long spool on each end to facilitate onsite fusion.

B. Backup Rings:

- 1. Convolved for Flanged Connections:
 - a. ASTM A536, ductile iron.
 - b. Complete with one-piece, molded polyethylene flange adapters.
 - c. Flanged Connections: Same or greater pressure rating as pipe.
- 2. Ductile Iron: Shop-coated with two-part epoxy material in accordance with AWWA C550. Dry film thickness shall be 10 mils minimum.
- 3. Gaskets: Material, size, and thickness shall be as recommended by gasket manufacturer and in accordance with PPI Technical Note 38. Gasket manufacturer shall provide a table with recommended bolt torque and tightening pattern.

C. Joints:

- 1. Thermal butt-fusion or electrofusion, except where connecting to unions, valves, and equipment with flanged or threaded connections that may require future disassembly. Use appropriate transition fitting or adapter for all joints that are not thermal butt-fused.
- 2. Depending on Site conditions, perform butt fusion joining in or outside of excavation. Latest McElroy data logger model shall be used to record proper joint fusion for each joint. No fused pipe joint shall be installed until it has passed according to the data logger output. Hard copy and electronic record for each joint shall be submitted. Butt-fusion shall be performed in accordance with pipe manufacturer's recommendations as to equipment and technique.
- 3. Electrofusion coupling joints shall only be allowed for closures and where approved by Engineer.

D. Bolts, Nuts, and Washers:

- 1. Bolt Materials: Type 304 stainless steel, ASTM A193/A193M, Grade B8 hex-head, carbide solution treated and strained hardened.
- 2. Bolt Fabrication: In accordance with ASME B18.2.1
- 3. Nut Materials: Type 304 stainless steel, ASTM A194/A194M, Grade 8 hex-head.
- 4. Nut Fabrication: In accordance with ASME B18.2.2.

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5. Washers: Type 304 stainless steel. Same material as bolts in accordance with ASME B18.21.1.
 6. Thread Lubricant: Provide bolt manufacturer's recommended lubricant on bolt threads, nuts, nut face, and around bolt hole.
- E. Wall Anchor:
1. Material: Same as HDPE pipe.
 2. Internal Diameter: Equal to adjacent pipe.
 3. Shear Strength: Equal to or greater than tensile strength of adjacent pipe.
 4. Fabrication: Butt fusion. Extrusion bead welding is not allowed.
- F. Electrofusion Couplings:
1. Material: HDPE.
 2. Method of Attachment: Electrofusion.
 3. Designed for coupling HDPE pipe.
 4. Manufacturers:
 - a. Central Plastics Company.
 - b. ISCO Industries.
- G. Products that restrain HDPE pipe with wedges or clamps are not acceptable.

PART 3 EXECUTION

3.01 INSTALLATION

- A. General:
1. Install polyethylene pipe in conformance with AWWA M55, PPI TR-33, ASTM F2620, and pipe manufacturer's recommendations.
 2. Follow all requirements of approved Installation Plan where HDPE is to be installed in ambient temperatures less than 50 degrees F, in hot conditions or in windy conditions.
 3. Protect and install pipe in accordance with the Temperature Control Plan when contraction of pipe length may cause damage to or pull out from structures.
- B. Joining:
1. Butt-fuse pipes and fittings in accordance with pipe manufacturer's recommendations. Depending on Site conditions, perform butt-fusion joining in or outside of excavated trench.

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2. If HDPE pipe surface temperature is above 80 degrees F as measured with infrared temperature gun, allow pipe to cool prior to making any connections to flanges, existing pipeline systems, or structures.
3. Electrofusion Couplings:
 - a. Where approved by Engineer, electrofusion couplings may be utilized for joining pipe.
 - b. Prepare pipe surface and install coupling in accordance with the manufacturer's instructions.
 - c. Record fusion time after coupling installation is complete and clamps have been removed.
4. Connect HDPE pipe to auxiliary equipment such as valves, pumps, tanks, and other piping systems with flanged connections as follows:
 - a. Polyethylene flange adapter, thermally butt-fused to end of pipe. Flange "stub ends" are not allowed.
 - b. Convolute backing flange, as specified.
 - c. Bolt and nut of sufficient length to show a minimum of three complete threads when joint is made and tightened to manufacturer's standard.
 - d. Follow requirements of PPI Technical Note 38 including mandatory 4-hour bolt re-torquing.
 - e. Backfill HDPE pipe up to connection point prior to making final connection to other piping system.
5. Special Precautions at Flanges: Support polyethylene pipe connected to heavy fittings, manholes, and rigid structures in such a manner that no subsequent relative movement between polyethylene pipe at flanged joint and rigid structures is possible.
6. Minimum Long-Term Field Bending Radius: Restricted to limits recommended by AWWA M55, Table 8-2.

C. Placement in Trench:

1. Control water in trench per Section 204 of the Standard Specifications.
2. Handle joined pipeline in such a manner that pipe is not damaged by dragging it over sharp and cutting objects.
3. Position slings for handling pipeline away from butt-fused joints.
4. Remove sections of damaged pipe and replace it with undamaged pipe. Damaged pipe is defined as pipe with kinks or gouges exceeding 10 percent of pipe wall thickness.
5. Exercise care when lowering pipe into trench to prevent damage or twisting of pipe.
6. At flanges, valves, and connections, excavate out trench bottom sufficiently to ensure clearance between undisturbed trench bottom and flange, valve, or connection.

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7. Temperature Requirements: Cover all exposed HDPE near connections as required to prevent temperature fluctuations. Do not connect HDPE to valves or existing pipelines until the pipe has been backfilled for a minimum of 48 hours.

3.02 FIELD QUALITY CONTROL

A. Joint Butt Fusion:

1. Measure and log each joint fusion by an electronic monitoring device (data logger) affixed to fusion machine. Data to be logged shall include the following and shall be capable of being retrieved electronically:
 - a. Pipe size, dimensions, and wall thickness.
 - b. Machine model and size.
 - c. Operator identification.
 - d. Job identification number.
 - e. Weld number.
 - f. Fusion, heating, and drag pressure settings.
 - g. Heater plate temperature.
 - h. Time stamp showing when weld was performed.
 - i. Heating and curing time of weld.
 - j. Curing temperature readings and time stamps of readings.
 - k. Error messages and warnings for out of range temperature or pressure settings.
2. In addition to logged items above, the following shall be logged or annotated on report:
 - a. Location of joint being fused by pipeline station or by reference to pipe Shop Drawing.
 - b. Ambient temperature, wind speed, precipitation, and humidity.
 - c. If internal bead was removed.
 - d. Environmental actions taken (such as, use of tarps, enclosures, and blankets).
 - e. Type of HDPE and manufacturer.

B. Joint Weld Inspection:

1. Visually examine each joint in accordance with the guidelines in ASTM F2620. Remove and replace any joints not meeting the standard.
2. Mechanical Joint Testing:
 - a. Pipe Wall Thickness 1-Inch or Less: Test joints in accordance with bend back testing provided in Appendix X4 of ASTM F2620.
 - b. Pipe Wall Thickness Greater than 1-Inch: Test joints in accordance with the guided side bend testing in accordance with ASME BPVC, Section IX, Article XXI-XXIV.

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- c. Specimens: Cut pipe 12 inches on each side of field made joint. Rejoin ends and proceed with Work.
- d. Test Frequency:
 - 1) First 1,000 Linear Feet: Three joints selected at random by Engineer.
 - 2) Each Additional 1,000 Linear Feet: One joint selected at random by Engineer.
 - 3) Each Test Failure: Two additional joints selected at random by Engineer.

C. Pipeline Hydrostatic Test:

1. General:

- a. Notify Engineer in writing 5 days in advance of testing. Perform testing in presence of Engineer.
- b. Furnish testing equipment and perform tests in manner satisfactory to Engineer. Testing equipment shall provide observable and accurate measurements of initial service leak and allowable make-up water volume under specified conditions.
- c. Test newly installed pipelines.
- d. Isolate new pipelines that are connected to existing pipelines.
- e. Using water as test medium, pipes shall successfully pass a hydrostatic test prior to acceptance.
- f. Conduct field hydrostatic test on buried piping after trench has been completely backfilled. Testing may, as approved by Engineer, be done prior to placement of asphaltic concrete or roadway structural section.
- g. Contractor may, if field conditions permit and as determined by Engineer, partially backfill trench and leave joints open for inspection and conduct initial service leak test. Final field hydrostatic test shall not be conducted until backfilling has been completed as specified above.
- h. Dispose of water used in testing in accordance with federal, state, and local requirements.

2. Preparation:

- a. Install temporary thrust blocking or other restraint as necessary to prevent movement of pipe and protect adjacent piping or equipment. Make necessary taps in piping prior to testing.
- b. Wait 5 days minimum after concrete thrust blocking or designed thrust collars are installed to perform pressure tests. If high-early strength cement is used for thrust blocking, wait may be reduced to 2 days.
- c. Prior to test, remove or suitably isolate appurtenant instruments or devices that could be damaged by pressure testing.

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- d. New Piping Connected to Existing Piping: Isolate new piping with grooved-end pipe caps, blind flanges, or other means as acceptable to Engineer.
- 3. Procedure:
 - a. Test pressure shall be 120 psi as measured at low point of pipeline.
 - b. Maximum filling velocity shall not exceed 0.25 feet per second, calculated based on full area of the pipe.
 - c. Expel air from pipe system during filling.
 - d. Test procedure shall be in accordance with ASTM F2164.
 - 1) Initial Expansion Phase: Add water as required to maintain test pressure for 4 hours.
 - 2) Test Phase: Reduce pressure by 10 psi and start pressure test.
 - 3) Test is successful if pressure stays within 5 percent of initial value for 1 hour.
 - e. If test is not completed because of leakage, equipment failure, or other reasons, depressurize test section and allow it to relax for at least 8 hours before retesting.
 - f. If there is leakage, repair defective pipe section and repeat hydrostatic test.

3.03 DISINFECTION

- A. Conform to the requirements of Division 505.02.00, of the City of Albany Standard Construction Specifications.
- B. Active chlorine concentration shall not exceed 10 percent.

3.04 MANUFACTURER'S SERVICES

- A. Provide pipe manufacturer's representative at Site in accordance with for assistance during pipe joining operations and pipe installation.

END OF SECTION