

INTRODUCTORY INFORMATION

**DOCUMENT 00 01 01
TITLE PAGE**

<p>CONSTRUCTION OF</p> <p><u>Rock Canyon Aquifer Storage Booster Station & Transmission Line</u></p> <p>PROVOEN202320182</p> <p>BID NO. 1</p> <p>June 30, 2023</p>
<p>CONTRACT DOCUMENTS</p>



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**Bids only via SciQuest (www.purchasing.utah.gov), until 4:00 p.m. local time on
September 7, 2023.**

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Bid No. 1
June 30, 2023

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PROCUREMENT REQUIREMENTS

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INVITATION TO BID

PART 1 GENERAL

1.1 CONSTRUCTION CONTRACT

- A. Bidders are invited to bid on the Construction Contract known as **Rock Canyon Aquifer Storage Booster Station & Transmission Line (PROVOEN202320182), Bid No. 1.**
- B. The location of the work is: Provo Utah
- C. The Work generally includes, but is not limited to, the following:
 - 1. Pump station construction including, all mechanical, electrical, plumbing, structural, civil, and architectural.
 - 2. Pipe connections to existing water mains located at the pump station.
 - 3. Water main construction from the pump station to Rock Canyon.
 - 4. One pipe outlet in Rock Canyon.
 - 5. Two underground vaults.
 - 6. Commissioning of the system.
 - 7. Decommissioning and demolition of an existing pump station.

1.2 BID SUBMISSION AND BIDDING RESULTS

- A. Bids will be received until 4:00 p.m. local time on September 7, 2023 only via SciQuest (www.purchasing.utah.gov) online bidding system. Bids received after 4:00 p.m. will not be considered.
- B. Bidders will be informed of the Bid results via SciQuest (www.purchasing.utah.gov) or via e-mail Bidders will be informed of the Bid results via SciQuest (www.purchasing.utah.gov) or via e-mail.

1.3 BID BONDS

- A. A Bid Bond in the amount of 5 percent of the Bid must accompany each Bid in accordance with the Instructions to Bidders. The Bid Bond will be returned to each unsuccessful Bidder after tabulation and award of the Construction Contract.

1.4 BASIS OF BIDS

- A. Bids shall be on a unit price basis.

1.5 CONTRACT TIME

- A. The proposed date of Substantial Completion shall be included in the Bid.

1.6 EXAMINATION AND PROCUREMENT OF DOCUMENTS

- A. Complete sets of Contract Documents may be examined and obtained online at SciQuest (www.purchasing.utah.gov) after July 4, 2023.

1.7 PRE-BID MEETING

- A. There will be no pre-bid meeting.

1.8 RIGHT TO REJECT BIDS

- A. Provo City reserves the right to reject any or all Bids or to waive any informality or technicality in any Bid if deemed to be in the best interest of Provo City.

1.9 GOVERNING LAWS AND REGULATIONS

- A. This project maybe federally funded and may require the payment of specific wage rates. If the project is federally funded, then payroll submittal will be required. See 00 21 13 Instruction to Bidders for additional information.
- B. Bidders on this Work will be subject to the applicable provisions of all federal rules, laws and regulations or orders. **This may include compliance with the Build America Buy America Act (BABA Act; Public Law 117-58). See 00 45 15 Federal Contract Requirements and 00 21 13 Instructions to Bidders for additional information.**
- C. Bidder must provide proof that Bidder has completed the registration process in an approved immigration status verification system and is in full compliance with the immigration status verification program as well as all requirements of Utah Code Section 63G-12-302.
- D. Bidder will also be required to provide similar proof of compliance for any Subcontractor who works under the terms of the Contract Documents.

END OF DOCUMENT

DOCUMENT 00 21 13

INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.1 DEFINED TERMS

- A. Terms used in the Bid Documents that are defined in Article 1.1 of the General Conditions will have the meanings indicated in the General Conditions.
- B. General Conditions: as published in Document 00 72 00 in the Manual of Standard Specifications by the Utah Chapter of the American Public Works Association.

1.2 COPIES OF BID DOCUMENTS

- A. Bidders must use complete sets of Bid Documents in preparing Bids. OWNER and ENGINEER assume no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bid Documents.
- B. Bid Documents are made available to Bidders only for the purpose of obtaining Bids on the Work. No license or grant for any other use is given.
- C. Bidding Document copyrights shall remain with the OWNER.
- D. All provisions of the current edition of the 2017 Manual of Standard Specifications and Manual of Standard Plans published by the Utah Chapter of the American Public Works Association that are applicable to the Work are hereby made a part of the Contract Documents by reference. The publications may be purchased separately from the LTAP Center, Utah State University 8205 Old Main Hill, Logan UT 84322-8205.

1.3 MINIMUM QUALIFICATIONS AND REFERENCES

- A. To be awarded this project, CONTRACTOR shall have the below minimum qualifications and minimum number of references. Also see 00 41 00 Bid Form for qualification submission requirements and Section 3.3 of this Specification for Bid evaluation.
- B. CONTRACTOR, CONTRACTOR's project manager(s), and CONTRACTOR's superintendent(s) shall have demonstrated successful performance of completed projects without unresolved, unrealistic, unnecessary, frequent claims and/or arbitration, mediations, or litigation. Provide full resumes for Project Superintendent(s) and Project Manager(s).
- C. CONTRACTOR shall have successfully constructed a minimum of three (3) drinking water transmission pipelines 24-inch diameter or larger within the last 10 years.



- D. If submitting a Bid for Bid Schedule 1, then CONTRACTOR shall have successfully constructed a minimum of two (2) drinking water booster pump stations with multiple pumps, and multiple pumps with at least 300-horsepower motors within the last 10 years.
- E. CONTRACTOR's project superintendent(s) shall have at least 10 years of experience as a project superintendent and have successfully completed two (2) drinking water transmission pipelines of similar size and length within the last 10 years. If submitting a Bid for Bid Schedule 1, then CONTRACTOR's project superintendent(s) shall also have at least 10 years experience as a project superintendent and have successfully completed at least two (2) drinking water pump stations with minimum 300-horsepower per pump.
- F. CONTRACTOR's project manager(s) must have at least five (5) years of experience and show that they have been project manager on the construction of at least two (2) similar water transmission pipelines. If submitting a Bid for Bid Schedule 1, then CONTRACTOR's project manager(s) shall have at least 5 years experience as a project manager and also have successfully completed at least two (2) drinking water pump stations of similar size and complexity. Special consideration will be given to project managers with a BS degree or Project Manager certification (i.e., PMP).
- G. If submitting a Bid for Bid Schedule 1, then CONTRACTOR's Electrical Sub-CONTRACTOR's project superintendent(s) and project manager(s) shall have at least 10 years and 5 years, respectively, of experience as a project superintendent or project manager and have successfully completed at least one (1) drinking water booster pump station with multiple pumps with minimum 300 horsepower per pump.
- H. CONTRACTOR shall include major SUBCONTRACTORS, (i.e., pipeline, concrete), on the Bid Form if CONTRACTOR intends to use the SUBCONTRACTORS for the project. The SUBCONTRACTOR(s) shall meet all the requirements as outlined above.
- I. Provide five (5) references for whom the CONTRACTOR has performed work on similar projects who are familiar with the CONTRACTOR's abilities. This information must be provided as specified on the Bid Form.

1.4 PRE-BID COMMUNICATION

- A. The OWNER shall not be bound by any statements, representations, conclusions, or assumptions made by any party, whether oral or written, except for written statements that are issued in an Addendum by the ENGINEER to all prospective Bidders.

1.5 PHYSICAL CONDITIONS

- A. **In General:** Prior to submitting a Bid, each Bidder is responsible to review all available explorations, tests and data concerning surface conditions, subsurface conditions, and Underground Facilities at or contiguous to the site, or otherwise, which may affect cost, progress, performance or furnishing of the Work in accordance with the time, price and other terms and conditions of the Contract Documents.



- B. **Underground Facilities:** Information and data indicated in the Contract Documents regarding 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. The OWNER does not assume responsibility for the accuracy or completeness thereof other than as provided in paragraph 4.3A.2 of the General Conditions or unless expressly provided in the Modifications to General Conditions (Document 00 73 00M).
- C. **Additional Explorations and Tests:** If feasible as determined by OWNER, the OWNER will provide each Bidder access to the site to conduct any explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall obtain permits, fill all holes, clean up and restore the site to its former condition upon completion of such explorations. by requesting such an exploration or test, Bidder agrees to release, indemnify, defend, and save the OWNER harmless from all costs damages and liabilities an any kind whatsoever, including reasonable attorneys' fees, that may arise in connection with or as a result of the performance of such explorations or tests.

1.6 COMPENSATION AND QUANTITIES

- A. **In General:** The Bid price for any lump sum or unit price contract includes all labor, materials, and incidental work to fully complete the Work in a satisfactory manner under the terms of the Contract Documents. Bidders are responsible to inform themselves of the character of the Work to be performed.
- B. **Lump Sum Work:** If the Work is to be paid for on a lump sum basis, the lump sum will be the only sum paid.
- C. **Unit Price Work:** If any portion of the Work is to be paid for on a unit price basis, payment will cover only work actually performed and materials actually supplied at the unit prices bid and on the terms set forth in the Contract Documents, irrespective of any quantity approximations in the Bid Documents. Any quantity approximations in the Bid Documents are stated as a basis for determining Bids, and they do not fix the amount of Work to be done or materials to be furnished. Stated quantities are estimates for the purpose of doing the class of work required. Actual quantities will vary. The OWNER may deviate in either direction from any indicated quantities. The Bidder shall have no claim for any variation in quantity, except to the extent permitted in the General Conditions.

1.7 EXAMINATION OF SITE AND CONTRACT DOCUMENTS

- A. **In General:** The OWNER shall not be bound by any statements, representations, conclusions, or assumptions made by any party, whether oral or written, except for written statements that are issued in an Addendum.
- B. **Access:** The Contract Documents designate the site for performance of the Work. Bidder is responsible to investigate the site and understand all access requirements. All



additional off-site lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by Bidder.

- C. **Contract Documents:** The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 1.4; that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents; and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- D. **Bidder's Obligations:** In addition to Bidder's other responsibilities and obligations in connection with submitting a Bid, it is the responsibility of the Bidder before submitting a Bid, to:
1. Examine the Contract Documents thoroughly. Work items that ENGINEER believes are not typical for this type of construction are identified in the Special Provisions (Document 01 35 00S);
 2. Visit the site to become familiar with local conditions that may affect cost, progress, performance or furnishing of the Work;
 3. Investigate all applicable construction and labor conditions, quantities, and the character of the Work as they affect cost, progress, performance, or furnishing of the Work;
 4. Consider federal, state, and local Laws and Regulations that may affect cost, progress, performance or furnishing of the Work (***including the Build America Buy America Act; see 00 45 15 Federal Requirements***);
 5. Study and carefully correlate Bidder's observations with the Contract Documents;
 6. Review all available explorations and data concerning surface and subsurface conditions as set forth in Section 1.4 above; and
 7. Identify and notify ENGINEER in writing in the manner set forth in article 2.1 below of all specific conflicts, omissions, errors, or discrepancies in the Contract Documents, or if Bidder doubts their meanings.

The failure or omission of any Bidder to take any of the foregoing actions shall not in any way relieve Bidder of its Bid, or its obligation to furnish all material, equipment, labor, and services necessary to carry out the provisions of the Contract Documents and to complete the contemplated Work for the consideration set forth in its Bid. Submission of a Bid shall constitute prima facie evidence of compliance with these instructions.

- E. **Deviations from the Terms of the Contract Documents:** OWNER will not accept any deviations whatsoever from the printed terms of the Agreement and the Contract Documents, except by Addendum or Change Order.



1.8 EFFECT OF SUBMITTING BID.

- A. Bidders are responsible to carefully examine the Contract Documents, visit the site, and fully inform themselves so as to include in the Bid a sum to cover the cost of all items. Bidder's failure or omission to receive or examine any form, instrument, addendum, or other document, visit the site and become acquainted with existing conditions, or attend any pre-Bid Conference, shall in no way relieve Bidder from any obligations with respect to Bidder's Bid or the Construction Contract.
- B. By submitting a Bid, Bidder represents that Bidder has complied with all requirements of the Bid Documents; that the Bid is premised on properly performing and furnishing the Work required by the Contract Documents within the times specified; that the Bidder is informed of the conditions to be encountered and the character, quality and quantities of the Work; and that the Bidder believes the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- C. Submission of a Bid constitutes a promise that the Bidder will enter the Contract Documents in the form presented in the Contract Documents. Bidders should carefully examine all Contract Documents, including the required Bonds and insurance to be provided by the Bidder.
 - 1. The Performance Bond is a guarantee of faithful performance of the requirements of the Contract Documents, including all applicable warranties. The Payment Bond is a guarantee of payment of all labor, materials, or supplies used directly or indirectly in the prosecution of the Work provided in the Construction Documents.
 - 2. The sum of the Performance Bond and the Payment Bond shall be increased or decreased during the course of the Work in the event that Contract Modifications, Change Orders or Addenda increase or decrease the total contract price. The sum of each bond shall be in an amount equal to the completed contract price at the completion of the Work.
 - 3. OWNER does not provide any release of Performance Bonds or Payment Bonds. The bonds are in effect throughout all periods during which a suit may be brought under the provisions of applicable law.
- D. By submitting a Bid, Bidder represents that the matters stated therein are true and correct.

PART 2 BIDDING PROCEDURES

2.1 INTERPRETATIONS AND ADDENDA

- A. All requests for interpretation of the Contract Documents shall be made in writing and delivered to the ENGINEER no later than seven (7) calendar days prior to the last date for Bid submission. In the ENGINEER's discretion, ENGINEER will send the written



interpretation to all persons receiving a set of Bid Documents in the form of an Addendum. If the ENGINEER does not respond to a Bidder's request for interpretation the Bidder shall comply with the intent and terms of the Contract Documents.

- B. No oral interpretations shall be made to any Bidder. The OWNER shall not be responsible for or bound by any statements, interpretations, explanations, representations, conclusions, or assumptions made by any party, whether oral or written, except for written statements that are issued in an Addendum by the ENGINEER to all prospective Bidders.
- C. Each statement made in an Addendum is part of the Contract Documents at the location designated in the Addendum. A statement issued in an Addendum shall have the effect of modifying a portion of the Bid Documents when the statement in the Addendum specifies a particular section, paragraph or text and states that it is to be so modified. Only the specified section, paragraph or text shall be so modified, and all other portions of the Bid Documents shall remain in effect.
- D. Bidders shall sign to acknowledge their receipt of all Addenda issued. Bidders shall also acknowledge receipt of all Addenda in the space provided in the Bid.
- E. Except to postpone the Bid opening, no Addenda shall be issued within 48 hours of the Bid opening.

2.2 EQUIPMENT AND MATERIAL OPTIONS PRIOR TO BID OPENING

- A. If a Bidder or Supplier wishes to supply a product other than that identified in the Contract Documents, said Bidder or Supplier shall submit a written request for approval to the ENGINEER at least ten (10) calendar days prior to the date set for opening of Bids.
- B. The procedure for submission of any such product option shall be as set forth in Article 6.4 of the General Conditions. It is the sole responsibility of the Bidder or Supplier to submit complete descriptive and technical information so that ENGINEER can make a proper appraisal.
- C. ENGINEER's failure to act upon such a request within five (5) days after receipt shall be deemed a denial thereof.
- D. Any such approval is at the sole discretion of the ENGINEER and will be in the form of an Addendum issued to all Bidder's holding Bid Documents indicating that the additional equipment or materials are approved as equal to those specified for the Project.
- E. The Construction Contract, if awarded, will be on the basis of materials and equipment specified in the Drawings and Specifications and any changes permitted in any Addenda.



2.3 BID SECURITIES

- A. **Amount of Bid Security:** A Bid Security must accompany each Bid. The total amount of the Bid on which Bid security is to be based shall be the sum of all items of the Bid constituting the maximum amount of the possible award to the Bidder. The Bid Bond amount must equal at least five (5) percent of the total amount of the Bid.
- B. **Form of Bid Security:** The Bid Security may be in the form of a certified check, cashier's check, cash, or Bid Bond. No other form of Bid Security will be accepted. A Bid Bond must be issued by a licensed Utah agency on behalf of a surety company licensed to do business in the State of Utah. A cashier's check must be drawn on a bank doing business in the State of Utah and made payable to OWNER. If a cashier's check is used in lieu of a Bid Bond, or if the Bid Bond does not specifically so provide, a certificate from an approved surety company guaranteeing execution of performance and payment bonds in the full amount of the Bid must accompany the Bid.
- C. **Purpose of Submission:** By submitting a Bid Bond Bidder assures OWNER it will take all steps necessary to properly execute the Contract Documents.
- D. **Return of Bid Security:** OWNER will return Bid securities to Bidder within 7 days after award of the Construction Contract. Bid Bonds and cashier's checks of all Bidders will be held until the Construction Contract is awarded or all Bids have been rejected. The liability of OWNER in regard to the checks shall be limited only to the return of the checks.
- E. **Default:** In the event of failure or refusal of the Bidder to enter into the Construction Contract and the delivery to the OWNER a Performance Bond, Payment Bond and any other Bonds or documents required by the Contract Documents after Notice of Intent to Award by the OWNER, the Bidder forfeits the sum of the Bid Bond or cashier's check as liquidated damages to the OWNER.

2.4 COMPLETING BID DOCUMENTS

- A. The General Conditions identify all forms comprising the Bid Documents. The Bidder shall make no stipulations or alterations on the Bid forms. Bidder must use and execute only the Bid form and Bid Schedules. Bidder shall complete and submit all forms included in the Bid Form, Document No. 00 41 00.
- B. Bid shall comply with applicable federal requirements (see 00 45 15 Federal Requirements). Currently, it is not known if Federal requirements include compliance with BABAA and BABAA compliance requirements will not likely be known until after the Bid Closing Time.
- C. To maintain the project schedule, OWNER is proceeding with bidding and requiring Bidders to complete the Bid Schedule (document 00 43 00) such that Bidders' Bid for the Work and Completion schedule for BABA Act compliance is provided and also the Bid and Completion schedule is provided if BABA Act compliance is not required. Bidders shall also indicate on the Bid Schedule products, equipment and materials that



will not likely comply with the BABA Act due to not being available in adequate quantities and/or satisfactory quality. CONTRACTOR shall also list all products, equipment and materials that if used would increase the total Cost of the Work by more than 25%.

- D. ***Bidders must either: (1) complete all Bid Schedules; or (2) complete Bid Schedules 1A, 1B, 4A, 4B, 6 and 7; or (3) complete Bid Schedules 2A, 2B, 5A, 5B, 6 and 7.*** If applicable, furnish both the unit and total costs for each item. The total Bid price is the full price for the performance of all Work under the Contract Documents. Bidder shall initial any corrections, interlineations, alterations, or erasures made by the Bidder on Bidder's entries in the Bid Documents.
- E. Any Work or material which is specified in the Contract Documents, or which is necessary because of the nature of the Work, but which is not listed separately in the Bid Schedule shall not be measured or paid for separately. The cost of such Work or material shall be considered as included in the Contract Price.
- F. Bids by corporations must be executed in the corporate name by a corporate officer authorized to sign and must be properly attested to as an official act of the corporation. At the OWNER's request, authority to sign shall be submitted.
- G. Bids by partnerships or joint ventures must be executed in the partnership or joint venture name and signed by a partner or joint venture whose title and official address must be shown. If a partnership or joint venture is the low Bidder, the partnership or joint venture must also submit evidence to the OWNER of the responsibility of the partnership or joint venture as a Bidder in the manner directed by the ENGINEER.
- H. Where the Bidder is wholly owned subsidiary of another company, the Bid must so state, and the owner or parent corporation also must agree to sign and be bound with the Bidder.
- I. All names must be typed or printed under or near the signature. Signatures shall be in longhand.
- J. The Bid shall contain an acknowledgment of receipt of all Addenda. The Addenda numbers must be filled in on the Bid form.
- K. The Bidder's address, telephone number, and facsimile number for communications regarding the Bid must be shown on the first page of the Bid form.
- L. The divisions and sections of the specifications, and the identifications of any Drawings, shall not control Bidder in dividing the Work among subcontractors or suppliers, or delineating the Work to be performed by any specific trade.
- M. The base Bid and alternates shall include all Work required to be performed by the Contract Documents.
- N. The Government Records Access and Management Act (GRAMA), Utah Code Section 63G-2-101 et seq., cf. Provo City Code Section 3.13.010 et seq., states that certain information in the submitted Bid may be open for public inspection. If Bidder desires



to have information contained in its Bid protected from such disclosure, then Bidder may request such treatment by providing a written claim of business confidentiality and a concise statement of reasons supporting the claim of business confidentiality with the Bid (Provo City Code Section 3.13.308). All material contained in and/or submitted with the Bid becomes the property of OWNER and may be returned only at OWNER's option.

2.5 CONFLICT OF INTEREST, SUBCONTRACTORS

- A. Conflict of interest pertaining to Subcontractors is described in paragraph 6.5H of the General Conditions (Document 00 72 00).
- B. Bidder shall not subcontract more than 75 percent of the dollar value of the total contemplated Work (exclusive of the supply of materials and equipment to be incorporated in the Work) without OWNER's prior written approval.

2.6 SUBMISSION OF BIDS

- A. Bids shall be submitted at the time and place indicated in the Invitation to Bid. It is the sole responsibility of the Bidder to submit the Bid before the scheduled time.
- B. Bidder will make no recapitulations, stipulations, alterations, alternate submissions, or modifications in any manner to any of the Contract Documents.
- C. **All Bidders shall include the following documents with Bid including required signatures and notary verification where designated:**
 - 1. **Bid Form (Document 00 41 00) including CONTRACTOR's qualifications, references and qualifications and experience of proposed superintendent(s) and project manager(s).**
 - 2. **Bid Schedule (Document 00 43 00)**
 - 3. **Non-Collusion Affidavit of Prime Bidder (Document 00 45 38)**
 - 4. **Bid Security (Bid Bond Document 00 42 00)**
 - 5. **Non-Collusion Affidavit of Prime Bidder (Document 00 45 38)**
 - 6. **Status Verification System Affidavit (Document 00 45 37)**
 - 7. **Bidder Status Form (Document 00 43 38)**
 - 8. **Proposed Subcontractor Form (Document 00 43 36)**

Failure to include any of these documents will result in Bid being considered non-responsive and may be disqualified.
- D. Alternate Bids, other than those called for in the Bid form, will not be considered.
- E. No oral, telegraphic, telephonic, facsimile, or modified Bids will be considered.



2.7 MODIFICATION AND WITHDRAWAL OF BIDS

- A. At any time prior to the end of the bidding time, Bids may be modified or withdrawn via SciQuest (www.purchasing.utah.gov). Bid Security will be returned upon proper withdrawal of a Bid.
- B. Within 24 hours after the end of the bidding time, any Bidder may file written notice with OWNER that there was a substantial mistake made in the preparation of its Bid. Bidder must thereafter promptly demonstrate Bidder's mistake. The OWNER has sole discretion to determine whether to permit any modification or withdrawal or the return of any Bid Security.
- C. When it appears a mistake has been made, or when the OWNER desires an assurance of any matter, the OWNER may request a Bidder to confirm the Bid in writing.

2.8 BID RESULTS

- A. The bidding results will be shared with Bidders via SciQuest (www.purchasing.utah.gov) or via e-mail.
- B. Any Bids submitted after the time specified in the Invitation to Bid will not be considered.

2.9 BID ACCEPTANCE PERIOD

- A. All Bids remain subject to acceptance for 60 days after the day of the close of the bidding time. OWNER may, in its sole discretion, release any Bid and return the Bid security prior to that date.
- B. Bidders shall include a cost contingency for Acceptance of a Bid between 60 and 120 days after the close of the bidding time. If Award is made during this time, the cost contingency will be prorated by days after day 60 and added to the Bid. This cost contingency shall be included on the Bid Schedule in the provided location. This cost contingency will only be used if Award occurs between 60 and 120 days after the close of the bidding time. The cost contingency amount is subject to negotiation by OWNER.

PART 3 EVALUATION AND AWARD

3.1 INITIAL EVALUATION OF BIDS

- A. Each Bid will be evaluated by the Provo City Selection Committee in accordance with the Provo City Procurement Policy. Bids will be scored based on the items outlined below. Non-responsive Bids (those not conforming to the Bid requirements) may be eliminated. The CONTRACTOR bears sole responsibility for the items and information included, or not included, in CONTRACTOR's Bid. OWNER reserves the right to disqualify any Bid that includes significant deviations or exceptions to the Project



terms, conditions and/or Specifications. Final recommendations of the highest ranked CONTRACTOR(s) will be made by the Provo City Selection Committee.

B. Bid evaluation scoring will be performed using the below table.

Item	Criteria	Score	Weighting Factor	Possible Points
1	Construction Experience on similar facilities within the last 10-years	5 points maximum	5	25
2	Experience of principal employees to be assigned to Project. CONTRACTOR will not be committed to using these employees on this project, but OWNER reserves the right to take this into consideration	5 points maximum	5	25
3	Prior Project Performance (Based on meeting schedule, number of change orders, within budget, resolution of warranty issues)	5 points maximum	10	50
4	Contractor references and project verification	5 points maximum	15	75
5	Experience Assisting OWNERS and ENGINEERS with constructability and cost issues (Provide examples of work practices that illustrate good working relationships with OWNERS and ENGINEERS)	5 points maximum	5	25
6	Bid Amount	5 points maximum	20	100
7	Utah Licensure (Must submit proof of Utah licensure)			Pass/Fail - Failure to include, rejection of the Bid
8	Meet Minimum Qualifications (submit documentation)			Pass/Fail – Failure to include, rejection of the Bid
9	Evidence of Insurance and bonding capacity			Pass/Fail - Failure to include, rejection of the Bid
10	Status Verification System Affidavit (sign and submit accompanying form)			Pass/Fail - Failure to include, rejection of the Bid
11	Non-Collusion Affidavit of Prime Bidder (sign and submit accompanying form)			Pass/Fail - Failure to include, rejection of the Bid
12	Supplemental Information at CONTRACTOR's discretion			No scoring for this item but may enhance other categories.
	Total Points Possible			300

C. Scoring methodology

1. Points



Provo City

Instructions to Bidders

Rock Canyon Aquifer Storage Booster Station & Transmission Line 00 21 13-11

PROVOEN202320182, Bid No. 1

- a. Excellent – 5 points
 - b. Very good – 4 points
 - c. Good – 3 points
 - d. Fair – 2 points
 - e. Poor – 1 point
2. Weighting Factor
 - a. Each scored line item will be multiplied by the weighting (importance) factor as shown above. The scoring will be multiplied by the weighted importance factor to give the total points for that line item.
3. Pass/Fail
 - a. The Bid will be rejected if any of the criteria listed as Pass/Fail is not met.

3.2 SUBSEQUENT EVALUATION OF BIDDER'S QUALIFICATIONS

- A. Within seven (7) calendar days of ENGINEER's request, a Bidder, whose Bid is under consideration for award shall submit to the ENGINEER the following information for the Bidder. ENGINEER may request like information on Bidder's Subcontractors, Bidder's Suppliers, or any other information the ENGINEER may require.
 1. A current financial statement for the Work (as provided to bonding company);
 2. A chronological list of "in progress" and "completed" construction work done by Bidder during the last 3 years; including project name, address, owner, contract name, and current telephone number;
 3. Present construction commitments other than items listed in paragraph 2 above;
 4. Proposed organizational structure such as firm ownership, project manager, progress scheduler, and superintendent for the Work of this Project;
 5. Owned and rented equipment which is to be used to do the Work;
 6. Investigations, arbitration, litigation or claims which are pending, threatened, settled, or otherwise disposed of within the last three (3) years;
 7. Evidence of ability to perform and complete the Work in a manner and within the time limit specified. As a minimum, identify specific experience on projects similar to the Work in physical size, cost, and commercial nature. If the Work experiences of the project manager and superintendent designated to construct this project are different than that of the company, provide resumes of their work history. Include their actual project titles and indicate their actual responsibilities on each given project;



8. All matters consistent with federal, state, and local Laws and Regulations; and
 9. Such other data as may be called by the ENGINEER.
- B. If Bidder believes any information should be held confidential for business reasons, Bidder must submit a written claim of business confidentiality for that particular information and include a specific statement of the reasons supporting the claim pursuant to Utah Code Ann. § 63-2-308.
- C. Untimely response or failure to provide the requested information by Bidder will release OWNER of any obligation to further consider the Bidder's Bid.

3.3 EVALUATION OF BIDS

- A. OWNER reserves the right: to reject any and all Bids or any part thereof; to waive any informalities in the Bid Schedule and elsewhere; to negotiate and agree to contract terms with the successful Bidder; to disregard non-conforming, non-responsive, unbalanced, or conditional Bids; and to withhold the award for any reason deemed in the best interests of the OWNER.
- B. OWNER reserves the right to reject any Bid if OWNER believes that it would not be in the best interest of the Project or the OWNER. Without limitation, such rejection may be because the Bid is not responsive, or the Bidder is unqualified or of doubtful ability or the Bid or Bidder fails to meet any other pertinent standard or criteria established by OWNER.
- C. If the OWNER intends to make an award to a Bidder, a Notice of Intent to Award will be issued.
- D. OWNER may consider all information which OWNER believes is relevant when evaluating a Bid, including, without limitation:
1. The qualifications and experience of the Bidder and of the Subcontractors, Suppliers, and other persons and organizations proposed (whether or not the Bid otherwise complies with the prescribed requirements).
 2. Such alternates, unit prices and other data, as may be requested in the Bid Form, Bid Schedule, or written requests issued prior to OWNER's Notice of Intent to Award the Construction Contract.
 3. Operating costs, maintenance requirements, performance data, and guarantees of ability to provide the required materials and equipment.
 4. Corporate organization and capacity for any party.
 5. Ability to perform and complete the Work in the manner and within the time specified.
 6. Pending litigation.
 7. The amount of the Bid.



8. Proper licensing to do the Work in compliance with licensing laws of the State of Utah for contractors and subcontractors.
 9. All other relevant matters, consistent with OWNER's procurement code and administrative rules, OWNER's ordinances, and program policies.
- E. To establish qualifications of Bidder, OWNER may request such data indicated in the Bid Documents, conduct such investigations as OWNER deems appropriate, and consider any other information (whether obtained from the Bid, the Bidder, or any other source).
- F. If the Construction Contract is to be awarded, it will be awarded to the most responsive, qualified, and responsible Bidder as determined by the OWNER. Alternates may be accepted depending upon availability of OWNER's funds and as determined by the OWNER. Accepted alternates will be considered in determining the most responsive, qualified, and responsible Bidder.
- G. Bid Schedules will be evaluated as follows:
1. Discrepancies in the multiplication of quantities of Work items and unit prices will be resolved in favor of the unit prices. OWNER may correct Bid Schedule calculation errors accordingly.
 2. Prices written out in words shall govern over prices written out in numbers.
 3. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.
 4. Bids shall not contain any recapitulations of or changes in the Work to be done.
- H. The OWNER, in the OWNER's sole discretion, shall make determinations as to disqualification of Bidders or rejection of Bids. Such matters may include, without limitation, submission of more than one Bid by the Bidder (whether under the same or different names); evidence of collusion among Bidders; other commitments of Bidder which, in the OWNER's sole judgment, might hinder the Work; previous defaults, Bid irregularities when not waived in the best interests of the OWNER, delays or poor performance by Bidder on any project; official action against Bidder; and any other cause which, in the OWNER's sole discretion and judgment, is sufficient to justify disqualification of a Bidder or rejection of a Bid.

3.4 ADJUSTMENTS TO THE COST OF THE WORK AFTER OPENING OF BIDS

- A. The Contract Price identified in the Agreement represents the cost of the Work which is to be paid by the OWNER to the CONTRACTOR.
- B. Adjustments to the Contract Price which are agreed to between the OWNER and the successful Bidder shall be effected by signing an Agreement Supplement.



3.5 SUBSTITUTIONS

- A. The Construction Contract, if awarded, will be on the basis of materials and equipment described in the Drawings, Specifications, and any Addenda.
- B. After the Effective Date of the Construction Contract, the procedure for submitting an application for substitution is set forth in Article 6.4 of the General Conditions.

3.6 SUBMITTALS REQUIRED FOR AWARD OF CONTRACT

In order to execute the contract, the following documents shall be submitted to OWNER within ten (10) calendar days of the receipt of the NOTICE OF INTENT TO AWARD.

- A. **Performance Bond:** The OWNER's requirements as to performance bonds are as set forth in the Modifications to General Conditions (Document 00 73 00M). Specific requirements are set forth in the Performance Bond (Document 00 61 13).
 - 1. The form of the Bond should be carefully examined by the Bidder.
 - 2. When the successful Bidder delivers the executed Construction Contract to OWNER, it must be accompanied by the required Performance and Payment Bonds.
- B. **Payment Bond:** The OWNER's requirements as to payment bonds are as set forth in the Modifications to General Conditions (Document 00 73 00M). Specific requirements are set forth in the Payment Bond (Document 00 61 14).
 - 1. The form of the Bond should be carefully examined by the Bidder.
 - 2. When the successful Bidder delivers the executed Construction Contract to OWNER, it must be accompanied by the required Performance and Payment Bonds.
- C. **Certificate of Insurance:** The OWNER's requirements as to insurance are as set forth in the Modifications to General Conditions (Document 00 73 00M).
- D. **Status Verification System Affidavit:** The OWNER's requirements as to immigration status verification are set forth in the Modifications to General Conditions (Document 00 73 00M). Specific requirements are set forth in the Status Verification System Affidavit (Document 00 45 37).
- E. **Other Information:** When a determination has been made to award the Construction Contract, Bidder is required, prior to the award or after the award, or both, to furnish such other information as the ENGINEER requests.

3.7 SIGNING OF AGREEMENT

- A. Within ten (10) calendar days after OWNER issues Notice of Intent to Award the Construction Contract to the successful Bidder, the Bidder shall pick up, sign, and return to OWNER, the required number of copies of the Agreement (Document 00 52 00), bonds, insurance, and Status Verification System Affidavit: A minimum of four



(4) originals will be signed and returned to the OWNER. One executed original will be returned to the Bidder. Bidder shall comply with all execution requirements.

- B. All of Bidder's executions and submittals must be delivered to the OWNER before OWNER will execute the Construction Contract. The Construction Contract will not be deemed awarded and shall not be binding on the OWNER until it has been approved and executed by the OWNER, and a fully executed copy is formally delivered to the CONTRACTOR. The OWNER reserves the right to rescind its Notice of Intent to Award without liability, except for the return of Bidder's Bid Security, at any time before the Construction Contract has been fully executed by all parties and delivered to the CONTRACTOR.
- C. Transfers, delegations, or assignments of interests in the Contract Documents are prohibited, unless prior written authorization is received from the OWNER.
- D. At the time of Bidding, and the signing of the Agreement, and at all times during the Work, Bidder shall be properly licensed to do the Work and shall be in compliance with the license laws of the State of Utah, Provo City and Utah County. The Bidder shall also require all Subcontractors to do the same.
- E. If a Bidder fails to fully and properly execute the Construction Contract and provide all submittals required therewith within ten (10) calendar days after the date of the Notice of Intent to Award, the OWNER may elect to rescind the Notice of Intent to Award, and the OWNER shall be entitled to the full amount of Bidder's Bid Security, not as a penalty, but in liquidation of and compensation for damages sustained. In the OWNER's sole discretion, a Notice of Intent to Award may then be provided to another Bidder whose Bid is most advantageous to the OWNER, price and other factors considered.

END OF DOCUMENT



**DOCUMENT 00 39 12
NOTICE OF INTENT TO AWARD**

To: _____

PROJECT DESCRIPTION: Rock Canyon Aquifer Storage Booster Station & Transmission Line (PROVOEN202320182), Bid No. 1.

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids called: **Rock Canyon Aquifer Storage Booster Station & Transmission Line (PROVOEN202320182), Bid No. 1.**

You are hereby notified that your BID has been accepted for items in the amount of:

\$ _____.

In order to execute the contract, all documents as specified in Document 00 21 13 – 3.6 shall be submitted to the OWNER within seven (7) calendar days of the receipt of this NOTICE OF INTENT TO AWARD.

You are required to return an acknowledged copy of this NOTICE OF INTENT TO AWARD to the OWNER. Dated this ____ day of _____, 2023.

PROVO CITY CORPORATION
Owner

By _____
Barry Prettyman, P.E.

Title Project Engineer

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF INTENT TO AWARD is hereby acknowledged.

By _____

this the _____ day of _____, _____

By _____

Title _____

END OF DOCUMENT



Provo City

Notice of Intent to Award

**DOCUMENT 00 39 13
NOTICE TO PROCEED**

To: _____

Date: _____

PROJECT DESCRIPTION: Rock Canyon Aquifer Storage Booster Station & Transmission Line (PROVOEN202320182), Bid No. 1.

You are hereby notified to commence work in accordance with the Agreement dated _____ on or before _____ and you are to complete the WORK on or before _____. The date of completion of all WORK is therefore _____.

PROVO CITY CORPORATION

Owner

By _____

Barry Prettyman, P.E.

Title _____

Project Engineer

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged.

By _____

this the _____ day of _____, _____

By _____

Title _____

END OF DOCUMENT



Provo City

Notice to Proceed

DOCUMENT 00 41 00
BID FORM

PART 1 GENERAL

1.1 BID PROPOSAL

- A. After having personally and carefully examined all conditions surrounding the Work and the Contract Documents, the undersigned proposes to furnish all labor, equipment, tools and machinery and to furnish and deliver all materials not specifically mentioned as being furnished by the OWNER, which is required in and about the construction of the Construction Contract known as **Rock Canyon Aquifer Storage Booster Station & Transmission Line (PROVOEN202320182), Bid No. 1.**
- B. The undersigned proposes to complete the Work for the price or prices listed in the Bid Schedule (Document 00 43 00) and understands that quantities for Unit Price Work are not guaranteed.
- C. The undersigned proposes to furnish bonds with the Contract, signed by a surety company satisfactory to the OWNER, in an amount equal to the Contract amount conditioned to insure compliance with all requirements of the Contract Documents.
- D. The undersigned encloses a certified check, cashier's check, cash, or a Bid Bond for Dollars (\$_____) which is five (5) percent of the Bid amount payable to the OWNER, as a guarantee of good faith, and which it is agreed will be forfeited to the OWNER as liquidated damages in the event of the failure of the undersigned to enter into a contract and furnish satisfactory bonds to the OWNER.
- E. The undersigned proposes to execute the attached contract within ten (10) days after the Notice of Intention to Award, and to begin work within ten (10) days after being notified to do so by the OWNER.
- F. The undersigned agrees the Bid is genuine. The Bid is not made in the interest of or on behalf of any undisclosed person, firm or corporation. The undersigned agrees that they have not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid: that they have not solicited or induced any person, firm or corporation to refrain from bidding: and that they have not sought by collusion to obtain for itself any other advantage over any separate Bidder or over OWNER.
- G. If OWNER finds it necessary to further define the Work, Contract Price, Contract Time, or some other portion of the Construction Contract, after Bid opening, the Bidder promises to execute an Agreement Supplement prior to or concurrent with the execution of the Agreement, if the Agreement Supplement is acceptable to the Bidder.
- H. It is understood that the OWNER has the right to reject this proposal or to accept it at the prices listed in the Bid Schedule.



Provo City

Bid Form

PART 2 EXECUTION

2.1 BIDDER

A. The Bidder is as follows:

Name: _____

Address: _____

Telephone number: _____

Facsimile number: _____

Tax identification number: _____

B. Bidder holds license number _____, issued on the _____ day of _____, _____, by the Utah State Department of Commerce, Division of Occupational and Professional Licensing. Bidder is licensed to practice as a _____ Contractor. License renewal date is the _____ day of _____, _____.

C. The undersigned hereby acknowledges receipt of the following Addenda.

(list Addenda numbers here)

2.2 BIDDER'S GENERAL COMPANY INFORMATION

A. Type of corporation: _____

B. Incorporated in the State of: _____

C. Company Ownership and CEO: _____

D. Main Business Contact: _____

E. E-mail address: _____

F. Number of years in the general construction business: _____

G. Names and title of principal officers:



Provo City

Bid Form

2.3 BIDDER LICENSE INFORMATION

- A. Primary Classification: _____
- B. Type of License: _____
- C. Supplemental Classifications (if any): _____
- D. State and explain any disciplinary actions taken by the State of Utah to revoke or suspend the above license or attempts to investigate the license holder for business or construction related reasons (include on a separate sheets of paper and attach to the end of this Bid Form).

2.4 BIDDER BONDING INFORMATION

- A. Name, address, telephone number and e-mail address of surety company(ies) and agent(s) who will provide the required bonds:

- B. Maximum bonding amount: _____
- C. Ratio of Unused Bonding Capacity to Maximum Bonding Amount: _____

2.5 BIDDER'S SIMILAR PROJECT EXPERIENCE

- A. Present information on at least three (3) similar public drinking water pipeline projects completed by BIDDER in the past 10 years. Projects listed should demonstrate experience in the construction of projects that meet the minimum requirements listed for this project (see 00 21 13 Instructions to Bidders).
- B. If BIDDER intends to use Subcontractors to perform significant portions of the Work, then provide the same information for each proposed Subcontractor.
- C. Present this information on separate pages attached to the end of this Bid Form.
- D. Include the following information for each project.
 - 1. Name of project
 - 2. Owner including contact person name, phone number and e-mail address



3. Engineer including contact person name, phone number and e-mail address
4. Dates of Award, Substantial Completion, and Final Completion
5. Substantial Completion Date in Agreement and Final Completion Date in Agreement.
6. Total of all change order time extensions (identify Owner requested change orders).
7. Total project construction cost
8. Total construction cost of work performed by BIDDER
9. Total of all change order amounts (identify Owner requested change orders)
10. Pipe sizes, depth ranges, and pipe material
11. Were any claims or disputes filed? If so explain the nature and resolution of the claim/dispute.

2.6 BIDDER’S SUPERINTENDENT AND PROJECT MANAGER EXPERIENCE

- A. Present the proposed project superintendent(s) and project manager(s) full resume including experience identifying and meeting the minimum qualifications as described in 00 21 00 Instructions to Bidders.
- B. Present this information on separate pages attached to the end of this Bid Form.

2.7 BIDDER’S REFERENCES

- A. Provide five (5) references for whom the CONTRACTOR has performed work on similar projects who are familiar with the CONTRACTOR’s abilities.
- B. This information must be provided on the form located at the end of this section of the Specifications.

2.8 BIDDER’S SUBSCRIPTION

- A. Date: _____
- B. Bidder’s Signature: _____
- C. Please print Bidder’s name here: _____
- D. Title: _____



BIDDER Reference No. _____

BIDDER:	
Project Information:	
Project Name:	
Project Cost:	
Project Start Date:	
Project Substantial Completion Date:	
Reference Information:	
Reference Name:	
Reference Title:	
Reference Company:	
Reference Telephone No:	
Reference Email:	
Include a brief description of the project below:	

END OF DOCUMENT



Provo City

Bid Form

Rock Canyon Aquifer Storage Booster Station & Transmission Line 00 41 00-5

PROVOEN202320182, Bid No. 1

**DOCUMENT 00 42 00
BID BOND**

PART 1 GENERAL

1.1 PROCEDURE

- A. For filing purposes, add Bid Bond to the Contract Documents following this page.

END OF DOCUMENT

**DOCUMENT 00 43 00
BID SCHEDULE**

PART 1 GENERAL

1.1 DOCUMENT INCLUDES

- A. Price schedules.
- B. Measurement and payment provisions.

1.2 CONSTRUCTION CONTRACT

- A. The Construction Contract is known as **Rock Canyon Aquifer Storage Booster Station & Transmission Line (PROVOEN202320182), Bid No. 1.**

1.3 REFERENCES

- A. APWA 01 29 00: Payment Procedures.
- B. Document 00 52 00: Agreement.

1.4 SCHEDULES TO BE ADDED TO THE AGREEMENT

- A. This document will be added to the Agreement by reference.

PART 2 PRICE SCHEDULES

SCHEDULE 1A - BOOSTER STATION – BABA ACT COMPLIANCE REQUIRED

Bid Item Number	Description	Unit of Measure	Estimated Quantity	Unit Price	Extension
1	Mobilization/ Demobilization	Lump Sum	1	\$	\$
2	Traffic Control	Lump Sum	1	\$	\$
3	SWPPP	Lump Sum	1	\$	\$
4	Construction Surveying	Lump Sum	1	\$	\$
5	Quality Control	Lump Sum	1	\$	\$
6	Pump Station Structural	Lump Sum	1	\$	\$
7	Pump Station Pumps and Interior Piping	Lump Sum	1	\$	\$



Bid Item Number	Description	Unit of Measure	Estimated Quantity	Unit Price	Extension
8	Pump Station Exterior Piping	Lump Sum	1	\$	\$
9	Strawberry Vault	Lump Sum	1	\$	\$
10	Transmission Line Tie-in at Station 9+00	Lump Sum	1	\$	\$
11	Pump Station HVAC	Lump Sum	1	\$	\$
12	Pump Station Generator and Transfer Switch	Lump Sum	1	\$	\$
13	Pump Station Electrical Equipment	Lump Sum	1	\$	\$
14	Pump Station Electrical Equipment Installation and Wiring	Lump Sum	1	\$	\$
15	Exterior Fiber Optic Conduit	Lump Sum	1	\$	\$
16	Exterior Pull Boxes	Each	2	\$	\$
17	Demolition	Lump Sum	1	\$	\$
18	Pump Station Site Work	Lump Sum	1	\$	\$
19	Pump Station Landscaping	Lump Sum	1	\$	\$
				TOTAL	\$

SCHEDULE 1B - BOOSTER STATION – BABA ACT COMPLIANCE NOT REQUIRED

Bid Item Number	Description	Unit of Measure	Estimated Quantity	Unit Price	Extension
1	Mobilization/ Demobilization	Lump Sum	1	\$	\$
2	Traffic Control	Lump Sum	1	\$	\$
3	SWPPP	Lump Sum	1	\$	\$
4	Construction Surveying	Lump Sum	1	\$	\$
5	Quality Control	Lump Sum	1	\$	\$
6	Pump Station Structural	Lump Sum	1	\$	\$
7	Pump Station Pumps and Interior Piping	Lump Sum	1	\$	\$
8	Pump Station Exterior Piping	Lump Sum	1	\$	\$
9	Strawberry Vault	Lump Sum	1	\$	\$
10	Transmission Line Tie-in at Station 9+00	Lump Sum	1	\$	\$
11	Pump Station HVAC	Lump Sum	1	\$	\$



Bid Item Number	Description	Unit of Measure	Estimated Quantity	Unit Price	Extension
12	Pump Station Generator and Transfer Switch	Lump Sum	1	\$	\$
13	Pump Station Electrical Equipment	Lump Sum	1	\$	\$
14	Pump Station Electrical Equipment Installation and Wiring	Lump Sum	1	\$	\$
15	Exterior Fiber Optic Conduit	Lump Sum	1	\$	\$
16	Exterior Pull Boxes	Each	2	\$	\$
17	Demolition	Lump Sum	1	\$	\$
18	Pump Station Site Work	Lump Sum	1	\$	\$
19	Pump Station Landscaping	Lump Sum	1	\$	\$
				TOTAL	\$

SCHEDULE 2A - TRANSMISSION LINE – BABA ACT COMPLIANCE REQUIRED

Bid Item Number	Description	Unit of Measure	Estimated Quantity	Unit Price	Extension
1	Mobilization/ Demobilization	Lump Sum	1	\$	\$
2	Traffic / Trail Control	Lump Sum	1	\$	\$
3	SWPPP	Lump Sum	1	\$	\$
4	Construction Surveying	Lump Sum	1	\$	\$
5	Quality Control	Lump Sum	1	\$	\$
6	6" DIP	Lineal Feet	100	\$	\$
7	24" DIP	Lineal Feet	5,090	\$	\$
8	Connections at Stations 38+00 & 44+50	Each	2	\$	\$
9	Hydrants	Each	4	\$	\$
10	6" Gate Valve	Each	4	\$	\$
11	24" Butterfly Valve	Each	4	\$	\$
12	ASR North Side Discharge	Lump Sum	1	\$	\$
13	24" Valve Vault	Lump Sum	1	\$	\$
14	Electrical Equipment, Installation, and Wiring	Lump Sum	1	\$	\$
15	Conduit for Fiber Optic	Lineal Foot	6,000	\$	\$
16	Pull Boxes	Each	7	\$	\$
17	Water Service Replacement	Each	5	\$	\$
18	Water Main Relocation	Each	2	\$	\$



Bid Item Number	Description	Unit of Measure	Estimated Quantity	Unit Price	Extension
19	Pavement Removal and Bituminous Replacement	Ton	2,600	\$	\$
20	Imported Trench Zone Backfill	Ton	3,000	\$	\$
21	Rock Removal	Lineal Foot	100	\$	\$
22	Transmission Line Tie-in at Station 9+00	Lump Sum	1	\$	\$
23	Tie-in to 16" DIP near Station 63+60	Lump Sum	1	\$	\$
				TOTAL	\$

SCHEDULE 2B - TRANSMISSION LINE – BABA ACT COMPLIANCE NOT REQUIRED

Bid Item Number	Description	Unit of Measure	Estimated Quantity	Unit Price	Extension
1	Mobilization/ Demobilization	Lump Sum	1	\$	\$
2	Traffic / Trail Control	Lump Sum	1	\$	\$
3	SWPPP	Lump Sum	1	\$	\$
4	Construction Surveying	Lump Sum	1	\$	\$
5	Quality Control	Lump Sum	1	\$	\$
6	6" DIP	Lineal Feet	100	\$	\$
7	24" DIP	Lineal Feet	5,090	\$	\$
8	Connections at Stations 38+00 & 44+50	Each	2	\$	\$
9	Hydrants	Each	4	\$	\$
10	6" Gate Valve	Each	4	\$	\$
11	24" Butterfly Valve	Each	4	\$	\$
12	ASR North Side Discharge	Lump Sum	1	\$	\$
13	24" Valve Vault	Lump Sum	1	\$	\$
14	Electrical Equipment, Installation, and Wiring	Lump Sum	1	\$	\$
15	Conduit for Fiber Optic	Lineal Foot	6,000	\$	\$
16	Pull Boxes	Each	7	\$	\$
17	Water Service Replacement	Each	5	\$	\$
18	Water Main Relocation	Each	2	\$	\$
19	Pavement Removal and Bituminous Replacement	Ton	2,600	\$	\$



Bid Item Number	Description	Unit of Measure	Estimated Quantity	Unit Price	Extension
20	Imported Trench Zone Backfill	Ton	3,000	\$	\$
21	Rock Removal	Lineal Foot	100	\$	\$
22	Transmission Line Tie-in at Station 9+00	Lump Sum	1	\$	\$
23	Tie-in to 16" DIP near Station 63+60	Lump Sum	1	\$	\$
				TOTAL	\$

SCHEDULE 3 – DEDUCT FOR AWARD OF BOTH SCHEDULE 1 AND SCHEDULE 2 TO BIDDER

The sum of Schedule 1A and Schedule 2A will be reduced by \$ _____ if both Schedules are awarded to BIDDER.

The sum of Schedule 1B and Schedule 2B will be reduced by \$ _____ if both Schedules are awarded to BIDDER.

SCHEDULE 4A – BOOSTER STATION COMPLETION AND COST CONTINGENCY FOR AWARD BETWEEN 61 AND 120 DAYS AFTER BIDDING CLOSING TIME

Assuming receipt of a Notice to Proceed for the Booster Station Bid Schedule 1A on November 7, 2023, the Work will be Substantially Complete by _____ and Complete by _____.

Assuming receipt of a Notice to Proceed for the Booster Station Bid Schedule 1A on February 7, 2024, the Work will be Substantially Complete by _____ and Complete by _____.

The cost contingency for award between 61 and 120 days after bid closing is \$ _____.

SCHEDULE 4B – BOOSTER STATION COMPLETION AND COST CONTINGENCY FOR AWARD BETWEEN 61 AND 120 DAYS AFTER BIDDING CLOSING TIME

Assuming receipt of a Notice to Proceed for the Booster Station Bid Schedule 1B on November 7, 2023, the Work will be Substantially Complete by _____ and Complete by _____.



Assuming receipt of a Notice to Proceed for the Booster Station Bid Schedule 1B on February 7, 2024, the Work will be Substantially Complete by _____ and Complete by _____.

The cost contingency for award between 61 and 120 days after bid closing is \$ _____.

SCHEDULE 5A – TRANSMISSION LINE COMPLETION AND COST CONTINGENCY FOR AWARD BETWEEN 61 AND 120-DAYS AFTER BIDDING CLOSING TIME

Assuming receipt of a Notice to Proceed for the Transmission Line Bid Schedule 2A on November 7, 2023, the Work will be Substantially Complete by _____ and Complete by _____.

Assuming receipt of a Notice to Proceed for the Transmission Line Bid Schedule 2A on February 7, 2024, the Work will be Substantially Complete by _____ and Complete by _____.

The cost contingency for award between 61 and 120-days after bid closing is \$ _____.

SCHEDULE 5B – TRANSMISSION LINE COMPLETION AND COST CONTINGENCY FOR AWARD BETWEEN 61 AND 120-DAYS AFTER BIDDING CLOSING TIME

Assuming receipt of a Notice to Proceed for the Transmission Line Bid Schedule 2B on November 7, 2023, the Work will be Substantially Complete by _____ and Complete by _____.

Assuming receipt of a Notice to Proceed for the Transmission Line Bid Schedule 2B on February 7, 2024, the Work will be Substantially Complete by _____ and Complete by _____.

The cost contingency for award between 61 and 120-days after bid closing is \$ _____.



SCHEDULE 6 – PROPOSED ALTERNATE EQUIPMENT

CONTRACTOR proposes to use the below alternate equipment and if accepted the Contract Price will be reduced by the below Deduct.

PROPOSED ALTERNATIVE EQUIPMENT	DEDUCT
	\$
	\$
	\$
	\$
	\$

SCHEDULE 7 – BABA ACT MATERIAL AND EQUIPMENT NON-COMPLIANCE

PRELIMINARY LIST OF EQUIPMENT AND MATERIAL THAT MAY REQUIRE BABA ACT WAIVERS IF USED IN THE WORK DUE TO COST (INCREASES TOTAL PROJECT COST BY MORE THAN 25%) AND/OR NOT AVAILABLE IN ADEQUATE QUANTITIES OR SATISFACTORY QUALITY	REASON (COST OR NOT AVAILABLE)

PART 3 MEASUREMENT AND PAYMENT

3.1 GENERAL

- A. Units of measurement are listed above in the price schedule(s).
- B. See measurement and payment procedures in APWA Section 01 29 00.
- C. See Supplemental Specification 01 22 00S Measurement and Payment.
- D. ENGINEER will take all measurements and compute all quantities.
- E. CONTRACTOR will verify ENGINEER’s measurements and computations.
- F. CONTRACTOR will provide all equipment, workers, and survey crews to assist ENGINEER in making measurements.
- G. Frames and covers damaged by CONTRACTOR will be replaced at no additional cost to OWNER.



- H. If ENGINEER determines an existing frame or cover needs to be replaced, a new frame or cover will be provided by either OWNER or CONTRACTOR. A frame and cover supplied by CONTRACTOR will be paid for by using prices agreed to in a Change Order.
- I. CONTRACTOR will be responsible for the preservation of neighboring facilities not being demolished. If damage occurs during construction, proper restoration of all damage is required at no additional cost.

END OF DOCUMENT



**DOCUMENT 00 43 36
PROPOSED SUBCONTRACTOR FORM**

PART 1 GENERAL

1.1 BIDDER

A. Name: _____

Address: _____

B. Telephone Number: _____

1.2 CONSTRUCTION CONTRACT

A. The Construction Contract is known as **Rock Canyon Aquifer Storage Booster Station & Transmission Line (PROVOEN202320182), Bid No. 1.**

PART 2 REPORT

2.1 SUBCONTRACTOR AND SUPPLIER REPORT

- A. Failure of the Bidder to specify a Subcontractor for any portion of the Work constitutes an agreement by the Bidder that the Bidder is fully qualified to perform that portion, and that Bidder shall perform that portion.
- B. Bidder will be fully responsible to OWNER for the acts and omissions of Subcontractors and Suppliers and of persons either directly or indirectly employed by them, as Bidder is for the acts and omissions of persons employed by Bidder directly.
- C. Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor or Supplier and the OWNER. Bidder agrees each subcontract with Bidder's Subcontractor will disclaim any third party or direct relationship between OWNER and any Subcontractor or Supplier.
- D. The names and addresses of the Subcontractors and Suppliers who will work under the terms of the Contract Documents and the estimated dollar amount of each subcontract (in excess of 2 percent of the Bid sum) are set forth as follows.



Provo City

Proposed Subcontractor Form

Table 1 – BASE BID

SUBCONTRACTORS		
Name and Address	Nature and Extent of Work to be Sublet	Amount
1.		
2.		
3.		
SUPPLIERS		
Name and Address	Nature and Extent of Work to be Sublet	Amount
1.		
2.		
3.		
4.		

PART 3 EXECUTION

3.1 EFFECTIVE DATE

A. Bidder executes this Subcontractor and Supplier report and declares it to be a supplement to the Bid and in effect as of _____, _____.

3.2 BIDDER’S SUBSCRIPTION

- A. Bidder’s signature: _____
- B. Please print Bidder’s name here: _____
- C. Title: _____

END OF DOCUMENT



**DOCUMENT 00 43 38
BIDDER STATUS FORM**

PART 1 GENERAL

1.1 BIDDER

A. Name: _____

B. Address: _____

C. Telephone number: _____

D. Federal Tax ID Number: _____

1.2 CONSTRUCTION CONTRACT

A. The Construction Contract is known as **Rock Canyon Aquifer Storage Booster Station & Transmission Line (PROVOEN202320182), Bid No. 1.**

PART 2 REPORT

2.1 BIDDER STATUS REPORT

A. Bidder affirms the following information is true and correct.

1. Number of employees: _____

2. Bidder's firm is: (check the following as applicable)

Independently owned and operated.

An affiliate of*

A subsidiary of*

A division of*

A business with gross revenue in excess of \$ _____

A business with gross revenue below \$ _____



Provo City

Bidder Status Form

Rock Canyon Aquifer Storage Booster Station & Transmission Line 00 43 38-1

PROVOEN202320182, Bid No. 1

* PARENT COMPANY:

Name: _____

Address: _____

Telephone Number: _____

Facsimile Number: _____

PART 3 EXECUTION

3.1 EFFECTIVE DATE

- A. Bidder executes this status report and declares it to be a supplement to the Bid and in effect as of _____, 2023.

3.2 BIDDER'S SUBSCRIPTION

A. Bidder's Signature: _____

B. Please print Bidder's name here: _____

C. Title: _____

END OF DOCUMENT



Provo City

Bidder Status Form

Rock Canyon Aquifer Storage Booster Station & Transmission Line 00 43 38-2

PROVOEN202320182, Bid No. 1

SECTION 00 45 15 FEDERAL REQUIREMENTS

This Contract is subject to the requirements and regulations governing projects receiving Federal Funding. These include the following:

1.1 EQUAL EMPLOYMENT OPPORTUNITY

During the performance of the Work, CONTRACTOR agrees as follows:

- (1) CONTRACTOR will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. CONTRACTOR will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. CONTRACTOR agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

- (2) CONTRACTOR will, in all solicitations or advertisements for employees placed by or on behalf of the CONTRACTOR, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- (3) CONTRACTOR will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with CONTRACTOR's legal duty to furnish information.
- (4) CONTRACTOR will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of

CONTRACTOR's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

- (5) CONTRACTOR will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (6) CONTRACTOR will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (7) In the event of CONTRACTOR's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and CONTRACTOR may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- (8) CONTRACTOR will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each Subcontractor or vendor. CONTRACTOR will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event CONTRACTOR becomes involved in, or is threatened with, litigation with a Subcontractor or vendor as a result of such direction by the administering agency, CONTRACTOR may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, that if the applicant so participating is a state or local government, the above equal opportunity clause is not applicable to any agency,

instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of CONTRACTORS and Subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a CONTRACTOR debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon CONTRACTORS and Subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

1.2 DAVIS-BACON ACT

CONTRACTOR shall comply with the provisions of 29 C.F.R. § 5.5(a)(1)-(10) in full. CONTRACTOR shall include this compliance requirement in all CONTRACTOR's subcontracts.

1.3 COPELAND "ANTI-KICKBACK" ACT

CONTRACTOR shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. Part 3 as may be applicable, which are incorporated by reference into this contract.

Subcontracts. CONTRACTOR and all Subcontractors shall insert in any subcontracts the clause above and such other clauses as FEMA may by appropriate instructions require, and also a clause requiring the Subcontractors to include these clauses in any lower tier subcontracts. The prime CONTRACTOR shall be responsible for the compliance by any Subcontractor or lower tier Subcontractor with all of these contract clauses.

Breach. A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a CONTRACTOR and Subcontractor as provided in 29 C.F.R. § 5.12.

1.4 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Compliance with the Contract Work Hours and Safety Standards Act.

(1) Overtime requirements. No CONTRACTOR or Subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section CONTRACTOR and any Subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such CONTRACTOR and Subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. OWNER shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by CONTRACTOR or Subcontractor under any such contract or any other federal contract with the same prime CONTRACTOR, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime CONTRACTOR, such sums as may be determined to be necessary to satisfy any liabilities of such CONTRACTOR or Subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

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

1.5 FURTHER COMPLIANCE WITH THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT.

(1) CONTRACTOR or Subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of



the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid.

(2) Records to be maintained under this provision shall be made available by CONTRACTOR or Subcontractor for inspection, copying, or transcription by authorized representatives of the Department of Homeland Security, the Federal Emergency Management Agency, and the Department of Labor, and the CONTRACTOR or Subcontractor will permit such representatives to interview employees during working hours on the job.

1.6 CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

Compliance with Clean Air Act

CONTRACTOR agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.

CONTRACTOR agrees to report each violation to the (insert name of non-federal entity entering into the contract) and understands and agrees that the (insert name of the non-federal entity entering into the contract) will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency (FEMA), and the appropriate Environmental Protection Agency Regional Office.

The CONTRACTOR agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with federal assistance provided by FEMA.

Compliance with Federal Water Pollution Control Act

CONTRACTOR agrees to comply with all applicable standards, orders, or regulations issued pursuant to the federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251 et seq.

CONTRACTOR agrees to report each violation to the (insert name of the non-federal entity entering into the contract) and understands and agrees that the (insert name of the non-federal entity entering into the contract) will, in turn, report each violation as required to assure notification to the (insert name of the pass-through entity, if applicable), Federal Emergency Management Agency (FEMA), and the appropriate Environmental Protection Agency Regional Office.

CONTRACTOR agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with federal assistance provided by FEMA.

1.7 DEBARMENT AND SUSPENSION

Suspension and Debarment

This Contract is a covered transaction for purposes of 2 C.F.R. Part 180 and 2 C.F.R. Part 3000. As such, CONTRACTOR is required to verify that none of the CONTRACTOR's principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).

CONTRACTOR must comply with 2 C.F.R. Part 180, subpart C and 2 C.F.R. Part 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

This certification is a material representation of fact relied upon by (insert name of recipient/subrecipient/applicant). If it is later determined that CONTRACTOR did not comply with 2 C.F.R. Part 180, subpart C and 2 C.F.R. Part 3000, subpart C, in addition to remedies available to (insert name of recipient/subrecipient/applicant), the federal government may pursue available remedies, including but not limited to suspension and/or debarment.

The bidder or proposer agrees to comply with the requirements of 2 C.F.R. Part 180, subpart C and 2 C.F.R. Part 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

1.8 BYRD ANTI-LOBBYING AMENDMENT

Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352 (as amended)

CONTRACTORS who apply or bid for an award of more than \$100,000 shall file the required certification. Each tier certifies to the tier above that it will not and has not used federally appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-federal funds that takes place in connection with obtaining any federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the federal awarding agency.

1.9 REQUIRED CERTIFICATION LANGUAGE

CONTRACTOR shall sign and submit the following certification for each bid or offer exceeding \$100,000

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.

If any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.

The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, Title 31, U.S.C. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

1.10 PROCUREMENT OF RECOVERED MATERIALS

In the performance of this contract, CONTRACTOR shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired—

Competitively within a timeframe providing for compliance with the contract performance schedule;

Meeting contract performance requirements; or



At a reasonable price.

Information about this requirement, along with the list of EPA-designated items, is available at EPA's Comprehensive Procurement Guidelines webpage:

<https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>.

CONTRACTOR also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

1.11 PROHIBITION ON CONTRACTING FOR COVERED TELECOMMUNICATIONS EQUIPMENT OR SERVICES

(a) *Definitions.* As used in this clause, the terms backhaul; covered foreign country; covered telecommunications equipment or services; interconnection arrangements; roaming; substantial or essential component; and telecommunications equipment or services have the meaning as defined in FEMA Policy 405-143-1, Prohibitions on Expending FEMA Award Funds for Covered Telecommunications Equipment or Services (Interim), as used in this clause—

(b) *Prohibitions.*

- (1) Section 889(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232, and 2 C.F.R. § 200.216 prohibit the head of an executive agency on or after Aug. 13, 2020, from obligating or expending grant, cooperative agreement, loan, or loan guarantee funds on certain telecommunications products or from certain entities for national security reasons.
- (2) Unless an exception in paragraph (c) of this clause applies, CONTRACTOR and its Subcontractors may not use grant, cooperative agreement, loan, or loan guarantee funds from the Federal Emergency Management Agency to:
 - i. Procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;
 - ii. Enter into, extend, or renew a contract to procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;
 - iii. Enter into, extend, or renew contracts with entities that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system; or
 - iv. Provide, as part of its performance of this contract, subcontract, or other contractual instrument, any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system.



(c) *Exceptions.*

- (1) This clause does not prohibit CONTRACTORs from providing—
 - i. A service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements; or
 - ii. Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.
- (2) By necessary implication and regulation, the prohibitions also do not apply to:
 - i. Covered telecommunications equipment or services that:
 - a. Are not used as a substantial or essential component of any system; and
 - b. Are not used as critical technology of any system.
 - ii. Other telecommunications equipment or services that are not considered covered telecommunications equipment or services.

(d) *Reporting requirement.*

- (1) In the event CONTRACTOR identifies covered telecommunications equipment or services used as a substantial or essential component of any system, or as critical technology as part of any system, during contract performance, or CONTRACTOR is notified of such by a Subcontractor at any tier or by any other source, the CONTRACTOR shall report the information in paragraph (d)(2) of this clause to the recipient or subrecipient, unless elsewhere in this contract are established procedures for reporting the information.
- (2) CONTRACTOR shall report the following information pursuant to paragraph (d)(1) of this clause:
 - i. Within one business day from the date of such identification or notification: The contract number; the order number(s), if applicable; supplier name; supplier unique entity identifier (if known); supplier Commercial and Government Entity (CAGE) code (if known); brand; model number (original equipment manufacturer number, manufacturer part number, or wholesaler number); item description; and any readily available information about mitigation actions undertaken or recommended.
 - ii. Within 10 business days of submitting the information in paragraph (d)(2)(i) of this clause: Any further available information about mitigation actions undertaken or recommended. In addition, CONTRACTOR shall describe the efforts it undertook to prevent use or submission of covered telecommunications equipment or services, and any additional efforts that will be incorporated to



prevent future use or submission of covered telecommunications equipment or services.

(e) *Subcontracts*. CONTRACTOR shall insert the substance of this clause, including this paragraph (e), in all subcontracts and other contractual instruments.

1.12 DOMESTIC PREFERENCES FOR PROCUREMENTS

As appropriate, and to the extent consistent with law, CONTRACTOR should, to the greatest extent practicable, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States. This includes, but is not limited to iron, aluminum, steel, cement, and other manufactured products.

For purposes of this clause:

Produced in the United States means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

Manufactured products mean items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

1.13 BUILD AMERICA BUY AMERICA ACT PROCUREMENT PREFERENCE

As required by Section 70914 of the Bipartisan Infrastructure Law (also known as the Infrastructure Investment and Jobs Act), P.L. 117-58, on or after May 14, 2022, none of the funds under a federal award that are part of Federal financial assistance program for infrastructure may be obligated for a project unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States, unless subject to an approved waiver. The requirements of this section must be included in all subawards, including all contracts and purchase orders for work or products under this program.

Recipients of an award of Federal financial assistance are hereby notified that none of the funds provided under this award may be used for a project for infrastructure unless:

1. All iron and steel used in the project are produced in the United States--this means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States;
2. All manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation; and

3. All construction materials are manufactured in the United States—this means that all manufacturing processes for the construction material occurred in the United States.

The Buy America preference only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does a Buy America preference apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project, but are not an integral part of the structure or permanently affixed to the infrastructure project.

For further information on the Buy America preference, please visit www.doi.gov/grants/BuyAmerica. Additional information can also be found at the White House Made in America Office website: www.whitehouse.gov/omb/management/made-in-america/.

Waivers

When necessary, recipients may apply for, and the Department of the Interior (DOI) may grant, a waiver from these requirements, subject to review by the Made in America Office. The DOI may waive the application of the domestic content procurement preference in any case in which it is determined that one of the below circumstances applies:

1. Non-availability Waiver: the types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality;
2. Unreasonable Cost Waiver: the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent; or
3. Public Interest Waiver: applying the domestic content procurement preference would be inconsistent with the public interest.

There may be instances where an award qualifies, in whole or in part, for an existing DOI general applicability waiver as described at:

www.doi.gov/grants/BuyAmerica/GeneralApplicabilityWaivers. If the specific financial assistance agreement, infrastructure project, or non-domestic materials meets the criteria of an existing general applicability waiver within the limitations defined within the waiver, the recipient is not required to request a separate waiver for non-domestic materials.

If a general applicability waiver does not already apply, and a recipient believes that one of the above circumstances applies to an award, a request to waive the application of the domestic content procurement preference may be submitted to the financial assistance awarding officer in writing. Waiver requests shall include the below information. The waiver shall not include any

Privacy Act information, sensitive data, or proprietary information within their waiver request. Waiver requests will be posted to www.doi.gov/grants/buyamerica and are subject to public comment periods of no less than 15 days. Waiver requests will also be reviewed by the Made in America Office.

1. Type of waiver requested (non-availability, unreasonable cost, or public interest).
2. Requesting entity and Unique Entity Identifier (UEI) submitting the request.
3. Department of Interior Bureau or Office who issued the award.
4. Federal financial assistance listing name and number (reference block 2 on DOI Notice of Award)
5. Financial assistance title of project (reference block 8 on DOI Notice of Award).
6. Federal Award Identification Number (FAIN).
7. Federal funding amount (reference block 11.m. on DO Notice of Award).
8. Total cost of Infrastructure expenditures (includes federal and non-federal funds to the extent known).
9. Infrastructure project description(s) and location(s) (to the extent known).
10. List of iron or steel item(s), manufactured goods, and construction material(s) the recipient seeks to waive from Buy America requirements. Include the name, cost, countries of origin (if known), and relevant [PSC](#) or [NAICS](#) code for each.
11. A certification that the recipient made a good faith effort to solicit bids for domestic products supported by terms included in requests for proposals, contracts, and nonproprietary communications with the prime CONTRACTOR.
12. A statement of waiver justification, including a description of efforts made (e.g., market research, industry outreach) by the recipient, in an attempt to avoid the need for a waiver. Such a justification may cite, if applicable, the absence of any Buy America-compliant bids received in response to a solicitation.
13. Anticipated impact if no waiver is issued.

Approved waivers will be posted at www.doi.gov/grants/BuyAmerica/ApprovedWaivers; recipients requesting a waiver will be notified of their waiver request determination by an awarding officer.

Questions pertaining to waivers should be directed to the financial assistance awarding officer.

Definitions

“Construction materials” includes an article, material, or supply that is or consists primarily of:

- non-ferrous metals;
- plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
- glass (including optic glass);
- lumber; or
- drywall.

“Construction Materials” does **not** include cement and cementitious materials, aggregates such as stone, sand, or gravel, or aggregate binding agents or additives.

“Domestic content procurement preference” means all iron and steel used in the project are produced in the United States; the manufactured products used in the project are produced in the United States; or the construction materials used in the project are produced in the United States.

“Infrastructure” includes, at a minimum, the structures, facilities, and equipment for, in the United States, roads, highways, and bridges; public transportation; dams, ports, harbors, and other maritime facilities; intercity passenger and freight railroads; freight and intermodal facilities; airports; water systems, including drinking water and wastewater systems; electrical transmission facilities and systems; utilities; broadband infrastructure; and buildings and real property. Infrastructure includes facilities that generate, transport, and distribute energy.

“Project” means the construction, alteration, maintenance, or repair of infrastructure in the United States

1.14 ACCESS TO RECORDS

CONTRACTOR agrees to provide OWNER, the FEMA Administrator, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of CONTRACTOR which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.

CONTRACTOR agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

CONTRACTOR agrees to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.

1.15 DHS SEAL, LOGO, AND FLAGS

CONTRACTOR shall not use the DHS seal(s), logos, crests, or reproductions of flags or likenesses of DHS agency officials without specific FEMA pre-approval. The CONTRACTOR shall include this provision in any subcontracts.

1.16 COMPLIANCE WITH FEDERAL LAW, REGULATIONS AND EXECUTIVE ORDERS

This is an acknowledgement that FEMA financial assistance will be used to fund all or a portion of the contract. CONTRACTOR will comply with all applicable federal law, regulations, executive orders, FEMA policies, procedures, and directives.

1.17 NO OBLIGATION BY FEDERAL GOVERNMENT

The federal government is not a party to this contract and is not subject to any obligations or liabilities to the non-federal entity, CONTRACTOR, or any other party pertaining to any matter resulting from the contract.

1.18 PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS OR RELATED ACTS

CONTRACTOR acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the CONTRACTOR's actions pertaining to this contract.

1.19 AFFIRMATIVE SOCIOECONOMIC STEPS

If subcontracts are to be let, the prime CONTRACTOR is required to take all necessary steps identified in 2 C.F.R. § 200.321(b)(1)-(5) to ensure that small and minority businesses, women's business enterprises, and labor surplus area firms are used when possible.

END OF DOCUMENT

DOCUMENT 00 45 37
STATUS VERIFICATION SYSTEM AFFIDAVIT

PART 1 GENERAL

1.1 CONTRACTOR

- A. Name: _____
- B. Address: _____

- C. Telephone number: _____
- D. Facsimile number: _____

1.2 OWNER

- A. The name of the OWNER is Provo City Corporation

1.3 CONSTRUCTION CONTRACT

- A. The Construction Contract is known as **Rock Canyon Aquifer Storage Booster Station & Transmission Line (PROVOEN202320182), Bid No. 1.**

PART 2 REQUIREMENTS

2.1 REGISTRATION AND PARTICIPATION

- A. Bidder has completed a status verification system registration process and is in compliance with the requirements of Utah Code Section 63G-12-302.
- B. Bidder will supply their Company Information page from the status verification system's website (screen shot of enrollment or company information page). The Company Information page shall be submitted in conjunction with this Document 00 45 37 – Status Verification System Affidavit.
- C. Bidder will require similar affidavits of registration and participation, as well as Company Information pages from a status verification system website, for any subcontractor who works under the terms of these Contract Documents.



DOCUMENT 00 45 38
NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

State of _____)
) ss.
 County of _____)

_____ being first duly sworn deposes and says that:

- (1) He is _____ of _____,
 (Owner, partner, officer, representative or agent)
 the Bidder that has submitted the attached Bid;
- (2) He is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;
- (3) Such Bid is genuine and is not a collusive or sham Bid;
- (4) Neither the said Bidder nor any of its officers, partners, owner, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix any overhead, profit or cost element of the Bid price of any other Bidder, or to secure through any collusion, conspiracy connivance or unlawful agreement any advantage against the **Provo City Corporation** or any person interested in the proposed Contract; and
- (5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant

Signed _____

 (Title)



Subscribed and sworn to before me

this _____ day of _____, 2023.

(Title)

My commission expires: _____

END OF DOCUMENT



Provo City

Non-Collusion Affidavit of Prime Bidder

CONTRACTING REQUIREMENTS

**DOCUMENT 00 52 00
AGREEMENT**

PART 1 GENERAL

1.1 CONTRACTOR

- A. Name: _____
- B. Address: _____

- C. Telephone number: _____
- D. Facsimile number: _____

1.2 OWNER

- A. The name of the OWNER is Provo City Corporation.

1.3 CONSTRUCTION CONTRACT

- A. The Construction Contract is known as **Rock Canyon Aquifer Storage Booster Station & Transmission Line (PROVOEN202320182), Bid No. 1.**

1.4 ENGINEER

- A. Barry Prettyman, P.E. is the OWNER's representative and agent for this Construction Contract who has the rights, authority and duties assigned to the ENGINEER in the Contract Documents.

1.5 REPRESENTATION REGARDING ETHICAL STANDARDS FOR CITY OFFICERS AND EMPLOYEES AND FORMER CITY OFFICERS AND EMPLOYEES

- A. CONTRACTOR represents that it has not:
1. Provided an illegal gift or payoff to a City officer or employee or former City officer or employee, or his or her relative or business entity.
 2. Retained any person to solicit or secure this contract upon an agreement or understanding for a commission, percentage, or brokerage or contingent fee, other than bona fide employees or bona fide commercial selling agencies for the purpose of securing business.



PART 2 TIME AND MONEY CONSIDERATIONS

2.1 CONTRACT PRICE

- A. The Contract Price includes the cost of the Work specified in the Contract Documents, plus the cost of all bonds, insurance, permits, fees, and all charges, expenses or assessments of whatever kind or character.
- B. The Schedules of Prices awarded from the Bid Schedule (Document 00 43 00) are as follows.
 - 1. Schedule A- Base Bid
- C. An Agreement Supplement is not attached to this Agreement.
- D. Based upon the above awarded schedules and the Agreement Supplement (if any), the Contract Price awarded is: _____ dollars and _____ cents. (\$ _____).

2.2 CONTRACT TIME

- A. Substantial Completion of the Work shall occur:
 - 1. By _____, 202__
- B. Any time specified in work sequences in the Summary of Work shall be a part of the Contract Time.
- C. The OWNER anticipates that a Notice to Proceed will be given on the following date, but reserves the right to change such date:
Anticipated date of Notice to Proceed: _____

2.3 PUNCH LIST TIME

- A. The Work will be complete and ready for final payment within _____ days after the date CONTRACTOR receives ENGINEER's Final Inspection Punch List unless exemptions of specific items are granted by ENGINEER in writing, or an exception has been specified in the Contract Documents.
- B. Permitting the CONTRACTOR to continue and finish the Work or any part of the Work after the time fixed for its completion, or after the date to which the time for completion may have been extended, whether or not a new completion date is established, shall in no way operate as a waiver on the part of the OWNER of any of OWNER's rights under this Agreement.



2.4 LIQUIDATED DAMAGES

- A. Time is the essence of the Contract Documents. CONTRACTOR agrees that OWNER will suffer damage or financial loss if the Work is not completed on time or within any time extensions allowed in accordance with Part 12 of the General Conditions. CONTRACTOR and OWNER agree that proof of the exact amount of any such damage or loss is difficult to determine. Accordingly, instead of requiring any such proof of damage or specific financial loss for late completion, CONTRACTOR agrees to pay the following sums to the OWNER as liquidated damages and not as a penalty.
1. **Late Contract Time Completion:** Five hundred dollars and zero cents (\$500.00) for each day or part thereof that expires after the Contract Time until the Work is accepted as Substantially Complete as provided in Article 14.5 of the General Conditions.
 2. **Late Punch List Time Completion:** 50% of the amount specified for Late Contract Time Completion for each day or part thereof if the Work remains incomplete after the Punch List Time. The Punch List shall be considered delivered on the date it is transmitted by facsimile, hand delivery or received by the CONTRACTOR by certified mail.
 3. **Interruption of Public Services:** No interruption of public services shall be caused by CONTRACTOR, its agents, or employees, without the ENGINEER's prior written approval. OWNER and CONTRACTOR agree that in the event OWNER suffers damages from such interruption, the amount of liquidated damages stipulated below shall not be deemed to be a limitation upon OWNER's right to recover the full amount of such damages. Five hundred dollars and zero cents (\$500.00) for each day or part thereof of any utility interruption caused by the CONTRACTOR without the ENGINEER's prior written authorization.
- B. **Survey Monuments:** No land survey monument shall be disturbed or moved until ENGINEER has been properly notified and the ENGINEER's surveyor has referenced the survey monument for resetting. The parties agree that upon such an unauthorized disturbance it is difficult to determine the damages from such a disturbance, and the parties agree that CONTRACTOR will pay as liquidated damages the sum of \$1,000.00 to cover such damage and expense.
- C. **Deduct Damages from Moneys Owed CONTRACTOR:** OWNER shall be entitled to deduct and retain liquidated damages out of any money which may be due or become due the CONTRACTOR. To the extent that the liquidated damages exceed any amounts that would otherwise be due the CONTRACTOR, the CONTRACTOR shall be liable for such amounts and shall return such excess to the OWNER.

2.5 RIGHT OF OWNER TO TERMINATE CONTRACT

- A. OWNER, upon written notice, may terminate this Contract, or any part hereof, as a result of the CONTRACTOR's failure to render to the satisfaction of OWNER, the material, work and/or services required of it, including progress of the Work and such



abandonment or termination shall not be deemed a breach by OWNER. OWNER shall be the sole determinant in all termination for cause issues. The CONTRACTOR shall not be entitled, nor shall OWNER give any consideration to claims for any costs or for loss of anticipated revenue(s), including overhead and profit, due to the abandonment or termination of this Contract, or any part hereof, by OWNER for cause.

- B. Upon receipt of written notification from OWNER that this Contract, or any part hereof, is to be terminated, the CONTRACTOR shall immediately cease operation of the Work stipulated, and assemble all material that has been prepared, developed, furnished or obtained under the provisions of this Contract that may be in its possession or custody, and shall transmit the same to OWNER on or before the fifteenth day following the receipt of the above-written notice of termination, together with its evaluation of the cost of the Work performed. The CONTRACTOR shall be entitled to just and equitable payment in accordance with this Contract for any uncompensated Work satisfactorily performed prior to such notice.
- C. OWNER shall determine the amount of Work satisfactorily performed by the CONTRACTOR and OWNER's evaluation shall be used as a basis to determine the amount of compensation due the CONTRACTOR for this Work.
- D. Termination by OWNER for cause, default, or negligence on the part of the CONTRACTOR shall be excluded from the foregoing provision; termination costs shall not apply. OWNER reserves the right to make award in whole or in part on all items, or on all of the items, which are in the best interests of the OWNER.
- E. In addition to termination for cause as set forth herein, Provo City reserves the right to terminate this contract at any time for its own convenience upon written notice. In such circumstances, Provo City shall pay to contractor all amounts due for Work satisfactorily performed up to the point of termination and contractor shall vacate the worksite without delay.

2.6 FEDERAL REQUIREMENTS

- A. CONTRACTOR acknowledges to and for the benefit of OWNER that it understands the goods and services under this Agreement are being funded with federal monies and have statutory requirements commonly known as "Build America, Buy America," that requires all of the iron and steel, manufactured products, and construction materials used in the project to be produced in the United States ("Build America, Buy America Requirements") including iron and steel, manufactured products, and construction materials provided by CONTRACTOR pursuant to this Agreement. CONTRACTOR hereby represents and warrants to and for the benefit of OWNER (a) CONTRACTOR has reviewed and understands the Build America, Buy America Requirements, (b) all of the iron and steel, manufactured products, and construction materials used in the project will be and/or have been produced in the United States in a manner that complies with the Build America, Buy America Requirements, unless a waiver of the requirements is approved, and (c) the CONTRACTOR will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary



to support a waiver of the Build America, Buy America Requirements, as may be requested by the OWNER. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by CONTRACTOR shall permit OWNER or the federal funding authority to recover as damages against the CONTRACTOR any loss, expense, or cost (including without limitation attorney's fees) incurred by the OWNER or the federal funding authority resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the federal funding authority or any damages owed to the federal funding authority by OWNER). If CONTRACTOR has no direct contractual privity with the federal funding authority, as a lender or awardee to the OWNER for the funding of its project, OWNER and CONTRACTOR agree that the federal funding authority is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the federal funding authority.

PART 3 EXECUTION

3.1 CONTRACTOR'S SUBSCRIPTION AND ACKNOWLEDGMENT

- A. CONTRACTOR's signature: _____
- B. Please print name here: _____
- C. Title: _____
- D. CONTRACTOR's Utah license number: _____
- E. Notary Acknowledgement: In the Country of _____,
State of _____, on the _____ day of _____, 20____,
the foregoing instrument was acknowledged before me

(person acknowledging and the title or representative capacity, if any).

Notary's signature

Residing at

My commission expires:

Notary's seal



Provo City

Agreement

3.2 OWNER’S SUBSCRIPTION AND ATTESTATION

A. Reviewed by Project Engineer:

(Project Engineer)

B. Recommended for approval by City Engineer:

(City Engineer)

C. OWNER: Provo City Corporation

(Mayor’s Signature)

D. Attest

(SEAL)

E. Address for giving notices:

Provo City Corporation
Engineering Division
1377 South 350 East
Provo, Utah 84606

3.3 EFFECTIVE DATE

OWNER and CONTRACTOR execute this Agreement and declare it in effect as of the
__ day of _____, _____.

END OF DOCUMENT



**DOCUMENT 00 61 13
PERFORMANCE BOND**

PART 1 GENERAL

1.1 BOND

- A. Number: _____
- B. Amount: _____
_____ Dollars (\$ _____)

1.2 SURETY

- A. Name: _____
- B. Address: _____

- C. Telephone number: _____
- D. Facsimile number: _____

1.3 CONTRACTOR

- A. Name: _____
- B. Address: _____

- C. Telephone number: _____
- D. Facsimile number: _____

1.4 OWNER

- A. Provo City Corporation



Provo City

Performance Bond

1.5 CONSTRUCTION CONTRACT

- A. The Construction Contract is known as **Rock Canyon Aquifer Storage Booster Station & Transmission Line (PROVOEN202320182), Bid No. 1.**

1.6 DEFINED TERMS

- A. Terms used in this Performance Bond which are defined in Article 1.1 of the General Conditions (Document 00 72 00) will have the meanings indicated in the General Conditions.

PART 2 COVENANTS

2.1 SURETY'S AND CONTRACTOR'S RELATIONSHIP

- A. Surety as surety, and CONTRACTOR as principal, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the OWNER as obligee, for the performance of the Construction Contract, whether awarded or about to be awarded.
- B. If CONTRACTOR performs the Construction Contract, the Surety and the CONTRACTOR shall have no obligation under this Bond, except to participate in conferences indicated in Article 2.3.

2.2 NOTICE

- A. Notice to the Surety, the OWNER or the CONTRACTOR shall be sent by certified mail, facsimile, or hand delivered to the address shown on this Bond agreement.
- B. Notices sent as required by paragraph 2.2A shall be effective on the date on which such notice was sent.
- C. Notice may be sent by facsimile. Facsimile notice shall be effective on the date of transmission provided that a confirmation establishing the successful transmission of the notice is sent by first-class mail, postage prepaid, along with a copy of the notice transmitted, no later than twenty-four (24) hours after the facsimile notice is transmitted.
- D. If any notice requires a period of less than seven (7) days for response, the notice shall be sent by facsimile.
- E. If the time for response to any notice expires on a Saturday, Sunday or a legal holiday in the State of Utah, the time shall be extended to the next working day.

2.3 PROCEDURE TO INVOKE SURETY'S OBLIGATION

- A. If the CONTRACTOR fails to perform or to comply with the terms of the Construction Contract, and such failure to perform or to comply has not been waived by the



Provo City

Performance Bond

OWNER, the OWNER may notify the CONTRACTOR and the Surety, at their addresses described above, that the OWNER is considering declaring the CONTRACTOR in default.

- B. Before declaring the default, the OWNER shall request and attempt to arrange a conference with the CONTRACTOR and the Surety to be held at a time and place required by the OWNER to discuss methods of performing the Work.
- C. If the CONTRACTOR does not attend the conference or agree to cure any deficiencies in the CONTRACTOR's performance of the Work to the satisfaction of the OWNER, the OWNER may declare the CONTRACTOR in default and formally terminate the CONTRACTOR's right to complete the Work. Such default shall not be declared earlier than 10 days after the CONTRACTOR and the Surety have received notice as provided in article 2.2.
- D. If the Contract with the CONTRACTOR is terminated, the OWNER agrees to pay the unpaid Balance of the Contract Price to the Surety for completion of the Work in accordance with the terms of the Construction Contract or to a contractor selected by the Surety to perform the Work in accordance with the terms of the Construction Contract.

2.4 SURETY'S OPTIONS AT CONTRACTOR TERMINATION

- A. **Surety Completes the Work:** The Surety may undertake to perform and complete the Work itself, through its agents or through independent contractors.
- B. **Surety Obtains Bids or Proposals:** The Surety may obtain bids or negotiated proposals from qualified contractors acceptable to the OWNER for a contract for performance and completion of the Work.
 - 1. Such bids or proposals shall be prepared by the Surety for execution by the OWNER and the completion contractor selected.
 - 2. Surety shall secure the contract with Performance and Payment Bonds executed by a qualified surety equivalent to this Performance Bond and the Payment Bond (Document 00 61 14); and
 - 3. Surety shall pay to the OWNER the amount of damages as described in paragraph 2.6 in excess of the balance of the Contract Price incurred by the OWNER resulting from the CONTRACTOR's default.
 - 4. **Surety to Pay OWNER:** Surety may determine the amount not to exceed the amount of this bond specified in paragraph 1.1B, for which Surety believes it may be liable to pay, and tender payment therefore to the OWNER. OWNER has sole discretion to accept payment. If the OWNER refuses the payment tendered, or the Surety has denied liability in whole or in part, without further notice the OWNER shall be entitled to enforce any remedy available to the OWNER.



2.5 PROCEDURE FOR OWNER TO DECLARE SURETY IN DEFAULT

- A. The OWNER may declare the Surety to be in default upon the following procedures.
 - 1. The OWNER shall issue an additional written notice to the Surety, after declaring the CONTRACTOR in default as provided in Article 2.3, demanding that the Surety perform its obligations under this Bond.
 - 2. Surety shall respond to the OWNER within 15 days after receipt of the OWNER's additional notice, either denying the claim or accepting liability and exercising its' options under Article 2.4.

2.6 SURETY'S OBLIGATIONS

- A. After the OWNER has terminated the CONTRACTOR's right to complete the Construction Contract, and if the Surety elects to complete the Construction Contract as provided in Article 2.4, then the responsibilities of the Surety to the OWNER shall not be greater than those of the CONTRACTOR under the Construction Contract, and the responsibilities of the OWNER to the Surety shall not be greater than those of the OWNER under the Construction Contract.
- B. To the limit of the amount of this Bond, but subject to commitment by the OWNER to pay all valid and proper payments made to or on behalf of the CONTRACTOR under the Construction Contract, the Surety is obligated, without duplication, for:
 - 1. the responsibilities of the CONTRACTOR for correction of Defective Work and completion of the Construction Contract;
 - 2. design professional and delay costs resulting from the CONTRACTOR's default, and resulting from the actions or failure to act of the Surety under article 2.4; and
 - 3. liquidated damages which are or may become due for any reason.

2.7 UNRELATED OBLIGATIONS OF THE CONTRACTOR

- A. The Surety and the OWNER shall not be liable to others for obligations of the CONTRACTOR that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or changed on account of any such unrelated obligations.
- B. No right of action shall accrue on this Bond to any person or entity other than the OWNER or its heirs, executors, administrators, or successors.

2.8 SURETY WAIVES NOTICE OF ANY CHANGE

- A. Surety hereby waives notice of any change, including changes of Contract Time, Contract Price, and scope of Work, to the Construction Contract or to related subcontracts, purchase orders and other obligations.



2.9 VENUE

- A. Any suit or action commenced by OWNER under this Bond shall be for action in a court of competent jurisdiction in the State of Utah.

PART 3 EXECUTION

3.1 EFFECTIVE DATE

- A. Surety and CONTRACTOR execute this Bond agreement and declare it to be in effect as of the ___ day of _____, _____.

3.2 CONTRACTOR’S SUBSCRIPTION AND ACKNOWLEDGMENT

- A. Type of organization: _____
(corporation, partnership, individual, etc.)

- B. If CONTRACTOR is a corporation, attach a corporate resolution evidencing CONTRACTOR's authority to sign.

- C. CONTRACTOR’s signature: _____

- D. Please print name here: _____

- E. Title: _____

- F. Notary Acknowledgement: In the Country of _____,
State of _____, on the _____ day of _____, 20____,
the foregoing instrument was acknowledged before me

(person acknowledging and the title or representative capacity, if any).

Notary’s signature

Residing at

My commission expires:

Notary’s seal



3.3 SURETY'S SUBSCRIPTION AND ACKNOWLEDGMENT

- A. Attach evidence of Surety's corporate authority to sign.
- B. Surety's signature: _____
- C. Please print name here: _____
- D. Title: _____
- E. **Acknowledgment:** In the County of _____,
State of _____, on the _____ day of _____, _____,
before me, the undersigned notary, personally appeared _____,
who proved to me his/her identity through documentary evidence in the form of a
_____ to be the
person whose name is signed as the authorized Surety and acknowledged to me that this
document was signed voluntarily for its stated purpose.

Notary Public signature

Notary Public seal

END OF DOCUMENT



Provo City

Performance Bond

**DOCUMENT 00 61 14
PAYMENT BOND**

PART 1 GENERAL

1.1 BOND

- A. Number: _____
- B. Amount: _____
_____ Dollars (\$ _____)

1.2 SURETY

- A. Name: _____
- B. Address: _____

- C. Telephone number: _____
- D. Facsimile number: _____

1.3 CONTRACTOR

- A. Name: _____
- B. Address: _____

- C. Telephone number: _____
- D. Facsimile number: _____

1.4 OWNER

- A. Provo City Corporation



Provo City

Payment Bond

1.5 CONSTRUCTION CONTRACT

- A. The Construction Contract is known as **Rock Canyon Aquifer Storage Booster Station & Transmission Line (PROVOEN202320182), Bid No. 1.**

1.6 DEFINED TERMS

- A. Terms used in this Performance Bond which are defined in Article 1.1 of the General Conditions (Document 00 72 00) will have the meanings indicated in the General Conditions.

PART 2 COVENANTS

2.1 SURETY'S AND CONTRACTOR'S RELATIONSHIP

- A. Surety as surety, and CONTRACTOR as principal, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the OWNER as obligee, for the performance of the Construction Contract, whether awarded or about to be awarded.
- B. If CONTRACTOR performs the Construction Contract, the Surety and the CONTRACTOR shall have no obligation under this Bond.

2.2 NOTICE

- A. Notice to the Surety, the OWNER or the CONTRACTOR shall be sent by certified mail, facsimile, or hand delivered to the address shown on this Bond agreement.
- B. Notices sent as required by paragraph 2.2A shall be effective on the date on which such notice was sent.
- C. Notice may be sent by facsimile. Facsimile notice shall be effective on the date of transmission provided that a confirmation establishing the successful transmission of the notice is sent by first-class mail, postage prepaid, along with a copy of the notice transmitted, no later than twenty-four (24) hours after the facsimile notice is transmitted.
- D. If any notice requires a period of less than seven (7) days for response, the notice shall be sent by facsimile.
- E. If the time for response to any notice expires on a Saturday, Sunday or a legal holiday in the State of Utah, the time shall be extended to the next working day.



2.3 CONDITIONS OF SURETY'S LIABILITY

- A. With respect to the OWNER, this Bond agreement shall be null and void if the CONTRACTOR promptly takes the following actions:
1. promptly makes payment, directly or indirectly, for all sums due Claimants, and
 2. defends, indemnifies, and saves harmless the OWNER from all claims, demands, Liens or suits by any person or entity who furnished labor, materials, or equipment for use in the performance of the Work, provided the OWNER has tendered defense of such claims, demands, liens or suits to the CONTRACTOR and the Surety.

2.4 PROCEDURE TO INVOKE SURETY'S OBLIGATION

- A. **Concerning Claimants who have a Direct Contract with the CONTRACTOR:** The Surety shall have no obligation to Claimants under this Bond who are employed by or have a direct contract with the CONTRACTOR until Claimants have given notice to the Surety at the address shown on this Bond agreement and sent a copy, or notice thereof, to the OWNER, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
- B. **Concerning Claimant who does not have a Direct Contract with the CONTRACTOR:** The Surety shall have no obligation to Claimant under this Bond who does not have a direct contract with the CONTRACTOR until Claimant takes the following actions.
1. The Claimant shall furnish written notice to the CONTRACTOR and send a copy, or notice thereof, to the 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 were furnished or supplied or for whom the labor was done or performed.
 2. The Claimant shall have either received a rejection in whole or in part from the CONTRACTOR, or not received within 15 days of furnishing the above notice any communication from the CONTRACTOR by which the CONTRACTOR has indicated the claim will be paid directly or indirectly.
 3. Not having been paid within the above 15 days, the Claimant shall have sent a written notice to the Surety at the address described on this Bond agreement and sent a copy, or notice thereof, to the OWNER stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the CONTRACTOR.

2.5 SURETY'S OPTION TO SETTLE CLAIMS

- A. When the Claimant has satisfied the conditions of article 2.4, the Surety shall promptly and at the Surety's expense take the following actions.



Provo City

Payment Bond

Rock Canyon Aquifer Storage Booster Station & Transmission Line 00 61 14-3

PROVOEN202320182, Bid No. 1

1. Send an answer to the Claimant, with a copy to the OWNER, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
2. Pay or arrange for payment of any undisputed amounts.

2.6 SURETY'S OBLIGATION

- A. Surety's total obligations under this bond 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 the Surety.

2.7 USE OF FUNDS

- A. Amounts owed by OWNER to CONTRACTOR under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, against the Performance Bond (Document 00 61 13). By the CONTRACTOR furnishing and the OWNER accepting this Bond, they agree that all funds earned by the CONTRACTOR in the performance of the Work are dedicated as follows:
 1. The OWNER has first priority to use the funds for the completion of the Work.
 2. The CONTRACTOR and the Surety have second priority to use the funds to satisfy the obligations of the CONTRACTOR and the Surety under this Bond.

2.8 UNRELATED OBLIGATIONS OF THE CONTRACTOR

- A. The Surety and the OWNER shall not be liable to Claimants or others for obligations of the CONTRACTOR that are unrelated to the Construction Contract.
- B. The OWNER shall not be liable for payment of any damages, 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.

2.9 SURETY WAIVES NOTICE OF ANY CHANGE

- A. Surety hereby waives notice of any change to the Construction Contract including changes of Contract Time, Contract Price, and scope of Work, or to related subcontracts, purchase orders or other obligations.

2.10 VENUE

- A. Any suit or action commenced by a Claimant under this Bond shall be for action in a court of competent jurisdiction in the State of Utah.



2.11 COPIES OF THIS BOND

- A. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the CONTRACTOR or OWNER shall promptly furnish a copy of this Bond or shall permit a copy to be made.

PART 3 EXECUTION

3.1 EFFECTIVE DATE

- A. Surety and CONTRACTOR execute this Bond agreement and declare it to be in effect as of the ___ day of _____, _____.

3.2 CONTRACTOR’S SUBSCRIPTION AND ACKNOWLEDGMENT

- A. Type of organization: _____
(corporation, partnership, individual, etc.)
- B. If CONTRACTOR is a corporation, attach a corporate resolution evidencing CONTRACTOR's authority to sign.
- C. CONTRACTOR’s signature: _____
- D. Please print name here: _____
- E. Title: _____
- F. Notary Acknowledgement: In the Country of _____,
State of _____, on the _____ day of _____, 20____,
the foregoing instrument was acknowledged before me

(person acknowledging and the title or representative capacity, if any).

Notary’s signature

Residing at

My commission expires:

Notary’s seal



3.3 SURETY'S SUBSCRIPTION AND ACKNOWLEDGMENT

- A. Attach evidence of Surety's corporate authority to sign.
- B. Surety's signature: _____
- C. Please print name here: _____
- D. Title: _____
- E. **Acknowledgment:** In the County of _____,
 State of _____, on the _____ day of _____, _____,
 before me, the undersigned notary, personally appeared _____,
 who proved to me his/her identity through documentary evidence in the form of a
 _____ to be the
 person whose name is signed as the authorized Surety and acknowledged to me that this
 document was signed voluntarily for its stated purpose.

Notary's signature

Residing at

My commission expires:

Notary's seal

END OF DOCUMENT



DOCUMENT 00 62 16
CERTIFICATE OF INSURANCE

PART 1 GENERAL

1.1 PROCEDURE

- A. For filing purposes, add Certificates of Insurance to the Contract Documents following this page.
- B. Certificates of Insurance must include all requirements in Section 5.2 of the Modifications to General Conditions (Supplementary Conditions) (Document 00 73 00M).

END OF DOCUMENT



Provo City

Certificate of Insurance

DOCUMENT 00 73 00M
MODIFICATIONS TO GENERAL CONDITIONS
(Supplementary Conditions)

This document changes provisions specified in the General Conditions in the Manual of Standard Specifications published by the Utah Chapter of the American Public Works Association.

Delete the Defined Terms for Standard Plans and Standard Specifications (in Article 1.1 DEFINED TERMS) in their entirety and replace them with the following:

- 50. Standard Plans:** The graphical and text displays contained in the Manual of Standard Plans as published by the Utah ETAP Center, Utah State University, Logan UT, as amended by the 2022 Provo Standard Drawing Details document (available at www.provo.org/departments/public-works/city-engineering-division/standards-specifications-and-permits).
- 51. Standard Specifications:** The specifications contained in Manual of Standard Specifications of the Utah Chapter of the American Public Works Association as published by the Utah ETAP Center, Utah State University, Logan UT, as amended by the Specifications Section of the 2022 Provo Standard Drawing Details document (available at www.provo.org/departments/public-works/city-engineering-division/standards-specifications-and-permits).

Add the following Defined Terms to Article 1.1 DEFINED TERMS

- 61. BABAA:** refers to the **Build America, Buy America Act requirements as mandated in the Infrastructure Investment and Jobs Act Public Law Number 117-58, §§ 70901-52.**
- 62. BABA:** refers to BABAA
- 63. City:** refers to OWNER.
- 64. DHS:** refers to the Department of Homeland Security
- 65. DOI:** refers to the Department of the Interior
- 66. EPA:** refers to the Environmental Protection Agency
- 67. FEMA:** refers to the Federal Emergency Management Agency
- 68. Provo City:** refers to OWNER.
- 69. Provo Corporation:** refers to OWNER.
- 70. Public Relations Plan:** refers to the plan prepared by CONTRACTOR to meet the requirements of Supplemental Specification 01 11 00S, Section 1.10.



- 71. Public Relations Supervisor:** refers to the individual required by Supplemental Specification 01 11 00S, Section 1.10.
- 72. Schedule of Submittals:** the document required by Supplemental Specification 01 33 00S.
- 73. Standard Details:** refers to the 2022 Provo Standard Drawing Details document (available at www.provo.org/departments/public-works/city-engineering-division/standards-specifications-and-permits).
- 74. Supplemental Specifications:** refers to the Specifications in the Project Manual and Contract Documents that amend or replace some Standard Specifications, Standard Plans, and Standard Details as indicated in the Supplemental Specifications.

Add the following paragraphs to Article 2.2 COPIES OF DOCUMENTS:

- B. OWNER shall not furnish to CONTRACTOR published Contract Documents which include the Manual of Standard Plans and the Manual of Standard Specifications. Such documents shall be purchased separately by the CONTRACTOR.
- C. Copies of all Contract Documents including the Manual of Standard Plans and the Manual of Standard Specifications shall be provided on site by the CONTRACTOR.

Delete Article 2.5, paragraph C and replace with the following:

- C. Field Office: An on-site field office is not required; however, CONTRACTOR shall provide and maintain a telephone in the field during performance of the Work such that ENGINEER may always contact CONTRACTOR for transmittal of plans, instructions, and dissemination of project information.

Delete Article 5.1 PERFORMANCE, PAYMENT, AND OTHER BONDS in its entirety and replace with the following:

5.1 PERFORMANCE, PAYMENT, AND OTHER BONDS

- A. Prior to OWNER executing the Agreement, CONTRACTOR shall file with the OWNER a good and sufficient performance Bond and a payment Bond, each in the sum of not less than 100 percent of the Contract Price/Agreement.
- B. The Bonds shall be executed by the CONTRACTOR and secured by a company duly and regularly authorized to do a general surety business in the State of Utah and either (i) named in the current U.S. Treasury Department's listing of approved sureties (Department Circular 570) (as amended) with an underwriting limitation equal to or greater than the Contract Price which the Bond guarantees, or (ii) with a current "A-" rating or better in A.M. Best Co., Inc's. Best Insurance Reports, Property and Casualty Edition.



- C. The Performance Bond shall guarantee the faithful performance of the Construction Contract by the CONTRACTOR and the payment Bond shall guarantee the payment of labor and materials. The Bonds shall inure by their terms to the benefit of the OWNER. Neither this nor any other provision requiring a performance Bond shall be construed to create any rights in any third-party Claimant as against the OWNER for performance of the Work under the Construction Contract.
- D. All Bonds required by the Contract Documents to be purchased and maintained by CONTRACTOR shall be obtained from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue Bonds for the limits so required. Such surety companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary General Conditions.
- E. If the surety on any Bond furnished by CONTRACTOR is subject to any proceeding under the Bankruptcy Code (Title 11, United States Code) or becomes insolvent or its right to do business is terminated in the State of Utah or it ceases to meet the requirements of this Article, CONTRACTOR shall, within 15 days thereafter, substitute another Bond and surety, both of which must be acceptable to OWNER.
- F. CONTRACTOR shall provide a Bid Bond equal to 5% of the contract bid.

Delete Article 5.2 INSURANCE in its entirety and replace with the following:

5.2 INSURANCE

- A. CONTRACTOR shall procure and maintain for the duration of the contract, insurance against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder by the contracting party, his agents, representatives, employees, or Subcontractors. The cost of such insurance shall be included in the Contracting party's proposal.
- B. The CONTRACTOR shall not commence Work under this Agreement until all of the insurance required herein shall have been obtained by the CONTRACTOR. The CONTRACTOR shall furnish to the OWNER Certificates of Insurance verifying that such insurance has been obtained. Such certificates will provide that OWNER will receive at least thirty (30) days prior written notice of any material change in, cancellation of, or non-renewal of such insurance.
- C. **Required Insurance Policies and Bonds:** CONTRACTOR (the CONTRACTOR) shall maintain or cause to be maintained on its behalf insurance policies of the types required below with insurance companies authorized to do business in the State of Utah, (i) having a Best Insurance Reports rating of "A" or better and a financial size category of "X" or higher, or (ii) otherwise being acceptable to the City with coverage limits and provisions at least sufficient to satisfy the requirements set forth below. All sureties shall be listed in the Department of the Treasury Circular 570, with bond amounts not exceeding the 'underwriting limitation' amount.
 1. **Workers' Compensation Insurance:** Statutory workers' compensation insurance (Part A). Such insurance shall also include employer's liability (Part B) insurance



in a limit of not less than \$1,000,000 for each: accident, disease, employee. No owner or officer may be excluded.

2. **General Liability Insurance:** Commercial general liability insurance on an occurrence basis arising out of claims for bodily injury (including death), property damage, products liability, completed operations liability, personal injury, advertising injury, damage to premises rented to CONTRACTOR. Such insurance shall provide coverage for ongoing operations and products-completed operations, blanket contractual, broad form property damage, independent CONTRACTORS, and sudden and accidental pollution liability with not less than \$5,000,000 per occurrence limit, with not less than \$5,000,000 aggregate limit, provided the general policy aggregate shall apply separately to the CONTRACTOR on a per project basis. Any aggregate limit that does not apply separately to the premises shall be at least double the required per occurrence limit.
 - a. Required Endorsements
 - 1) Additional Insured – Ongoing Operations (CG 20 10 or equivalent)
 - 2) Additional Insured – Completed Operations (CG 20 37 or equivalent)
 - 3) Primary and Noncontributory (CG 20 01 or equivalent)
 - 4) Aggregate Limit Per Project (CG 25 03 or equivalent)
 - 5) Waiver of transfer of rights of recovery against others to us (CG 24 04 or equivalent)
3. **Automobile Liability Insurance:** Automobile liability insurance for the CONTRACTOR's liability arising out of the use of owned (if any), leased (if any), non-owned and hired vehicles of the CONTRACTOR, with no less than \$5,000,000 limit per accident for combined bodily injury and property damage and containing appropriate no-fault insurance provisions wherever applicable. All owned and/or leased automobiles shall be covered using symbol "1" (any auto).
4. **Excess Liability Insurance:** The amounts of insurance required in the foregoing subsections (1), (2), (3) this subsection may be satisfied by the CONTRACTOR purchasing coverage in the amounts specified or by any combination of primary and excess insurance, so long as the total amount of insurance meets the required limits specified above. Evidence of excess liability or umbrella policies shall include a schedule of underlying coverages.
5. **CONTRACTORS Pollution (Environmental) Liability Insurance:** Environmental liability insurance for the CONTRACTOR's liability arising out of their operations in an amount not less than \$1,000,000 per occurrence, \$1,000,000 aggregate. Coverage shall apply to all operations undertaken by the CONTRACTOR.



6. **Professional Liability (Architects & ENGINEERs Errors & Omissions):** Professional liability insurance for the CONTRACTOR's liability arising out of their architectural, engineering and design activities in an amount not less than \$1,000,000 each claim, \$1,000,000 aggregate.
7. **Builder's Risk / Installation Floater:** CONTRACTOR shall provide optional terms for builder's risk insurance or installation floater. CONTRACTOR agrees to have City approve builder's risk insurance program including limits, deductibles, terms, etc. The City shall maintain the right to obtain and implement builder's risk or installation floater coverage at their discretion.
8. **INSURANCE PROVISIONS:**
 - a. **Additional Insurance Endorsements:** All policies of liability insurance required to be maintained by the CONTRACTOR shall be endorsed to name the OWNER and ENGINEER as additional insured for ongoing operations (ISO CG 20 10 or equivalent) and completed operations (ISO CG 20 37 or equivalent) (except for insurance policies required in previous Section [1,3,5,6,7]).
 - b. **Primary and Non-Contributory Endorsements:** The CONTRACTOR's insurance coverage shall be a primary insurance as respects to the City, its officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by the City, its officers, officials, employees, or volunteers shall be in excess of the contracting party's insurance and shall not contribute with it.
 - c. **Waiver of Subrogation Endorsements:** The CONTRACTOR hereby waives any and every claim for recovery from the City, lenders and their respective offices and employees for any and all loss or damage covered by any of the insurance policies to be maintained under this CONTRACTOR agreement to the extent that such loss or damage is recovered under any such policy. To the extent the foregoing waiver would preclude coverage under any insurance required by this Section, the CONTRACTOR shall give written notice of the terms of such waiver to each insurance company which has issued, or which may issue in the future, any such policy of insurance (if such notice is required by the insurance policy) and shall cause each such insurance policy to be properly endorsed, or to otherwise contain one or more provisions that prevent the invalidation of the insurance coverage by reason of such a waiver.
 - d. **Severability of Interests:** The contracting party's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respects to the limits of the insurer's liability.
 - e. **Deductibles and Self-Insured Retentions:** Any deductibles or self-insured retention, exceeding 5% limit of policy, must be declared to and approved by the City. At the option of the City, either; the insurer may be required to reduce or eliminate such deductibles or self-insured retention as respects the City, its



officers, officials, and employees; or the contracting party may be required to procure a bond guaranteeing payment of losses and related investigations, claim distribution and defense expenses.

- f. **Notice of Incident or Accident:** Contracting party shall agree to disclose to the City, all incidents or occurrences of accident, injury, and/or property damage, regardless of whether such incidents are submitted as claims under the CONTRACTOR's insurance policies.
- g. **Evidence and Verification of Insurance:** On or before the effective date of each policy and on an annual basis at least 10 days prior to each policy anniversary, the CONTRACTOR shall furnish the City with (1) certificates of insurance or binders, in a form acceptable to the City, evidencing all of the insurance required by the provisions of this Section. CONTRACTOR shall provide a certificate of insurance verifying completed operations coverage for a period of not less than two years after project completion. Certificates and endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates and endorsements are to be furnished to and accepted by the City before work commences. The City reserves the right to require complete, certified copies of all required insurance policies, with all endorsements, at any time.
- h. **Claims-Made Policies:** If any policy is a claims-made policy, the policy shall provide the CONTRACTOR the right to purchase, upon cancellation or termination by refusal to renew the policy, an extended reporting period (Tail) of not less than two years. The CONTRACTOR agrees to purchase such an extended reporting period if needed to ensure continuity of coverage. The CONTRACTOR's failure to purchase such an extended reporting period as required by this paragraph shall not relieve it of any liability under this Contract. If the policy is a claims-made policy, the retroactive date of any such policy shall be not later than the date this Contract is executed by the parties hereto. If the CONTRACTOR purchases a subsequent claims-made policy in place of any prior claims-made policy, the retroactive date of such subsequent policy shall be no later than the date this Contract is executed by the parties hereto.
- i. **Policy Cancellation and Change:** All insurance policies shall be endorsed so that if at any time they are canceled, such cancellation shall not be effective for the City for 30 days, except for non-payment of premium which shall be for 10 days. If any material change in coverage should occur, the CONTRACTOR shall provide notice of any material change in coverage to the City immediately.
- j. **Liability Limits:** The liability limits shown in this Section are minimum requirements. To the extent the CONTRACTOR maintains, or causes to be



maintained on its behalf, liability limits which are higher than the minimum limits stated in this Section, the higher liability limits shall be required of the CONTRACTOR.

- k. **Failure to Maintain Insurance:** In the event the CONTRACTOR fails, or fails to cause others on their behalf, to take out or maintain the full insurance coverage required by this Section, the City, upon 30 days' prior notice (unless the required insurance would lapse within such period, in which event notice will be given as soon as reasonably possible) to the CONTRACTOR of any such failure, may (but shall not be obligated to) take out the required policies of insurance and pay the premiums on the same. All amounts so advanced thereof by the City shall become an additional obligation of the CONTRACTOR to the City, and the CONTRACTOR shall pay such amounts to the City, together with interest thereon from the date so advanced. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the City, its officers, officials, employees, or volunteers.
- l. **No Duty to Verify or Review:** No provision of this Section or any provision of any Document related to this agreement shall impose on the City any duty or obligation to verify the existence or adequacy of the insurance coverage maintained by the CONTRACTOR, nor shall City be responsible for any representations or warranties made by or on behalf of the CONTRACTOR to any insurance company or underwriter. Any failure on the part of the City to pursue or obtain the evidence of insurance required by this agreement from the CONTRACTOR and/or failure of the City to point out any non-compliance of such evidence of insurance shall not constitute a waiver of any of the insurance requirements in this agreement.
- m. **Subcontractors:** CONTRACTOR shall include all Subcontractors as an insured under its policies or shall furnish separate certificates and endorsements for each Subcontractor. All coverages for Subcontractors shall be subject to the requirements stated herein.
- n. **Indemnification / Liability:** CONTRACTOR shall indemnify and hold harmless the City, its officers, agents, employees and volunteers from all damages, costs or expenses in law or equity, including attorney's fees, that may at any time arise or be set up because of damages to property, bodily injury or personal injury received by reason of or in the course of providing services to the City but only to the extent caused by any willful, negligent or wrongful act or omission of the contracting party, any of their employees or any SUBCONTRACTORS.
- o. **Loss Control and Safety:** The CONTRACTOR shall retain control over its employees, agents, servants, and Subcontractors, as well as control over its invitees, and its activities on and about the subject premises and the manner in



which such activities shall be undertaken and to that end, the CONTRACTOR shall not be deemed to be an agent of the City. Precaution shall be exercised at all times by the CONTRACTOR for the protection of all persons, including employees and property. The CONTRACTOR shall make special effort to detect hazards and shall take prompt action where loss control/safety measures should reasonably be expected.

Add the following paragraphs to Article 6.8 LAWS AND REGULATIONS

6.8 LAWS AND REGULATIONS

All Bidders are required to follow the requirements of Utah Code Annotated 63G-12-302 which prohibits the OWNER from entering into any contract for the performance of services with any successful bidder who does not first provide the OWNER with proof of registration and participation in a federally approved immigration status verification system to ensure that their employees are legally authorized to work in the United States. Failure to provide the required proof may be grounds for rejection of an otherwise successful bid. By submitting a bid CONTRACTOR certifies that CONTRACTOR does not, and will not during the performance of this Contract, knowingly employ, or subcontract with any entity which employs workers who are not legally authorized to work in the United States. CONTRACTOR agrees to require all its employees to provide proof of their eligibility to work in the United States and agrees to use all reasonable means to verify that proof. CONTRACTOR further agrees to require any Subcontractors engaged to work on the project to sign a Certification of Legal Work Status and submit the Certification to the OWNER prior to any work being performed by the Subcontractors. CONTRACTOR agrees to provide to the OWNER all documents necessary to verify compliance with applicable State and Federal immigration and labor laws. If CONTRACTOR knowingly employs workers or Subcontractors in violation of 8 USC § 1324a, such violation shall be cause for unilateral cancellation of the contract between CONTRACTOR and OWNER. In addition, CONTRACTOR may be suspended from participating in future projects with the OWNER. In the event this contract is terminated due to a violation of 8 USC § 1324a by CONTRACTOR or a Subcontractor of CONTRACTOR, CONTRACTOR shall be liable for any and all costs associated with such termination, including, but not limited to, any damages incurred by the OWNER as well as attorney fees. For purposes of compliance, the OWNER requires CONTRACTOR and Subcontractors to use an immigration status verification system such as E-Verify, or other approved system as outlined in Utah Code Annotated 63G-12-302, to verify the employment eligibility of all employees. CONTRACTOR and Subcontractors must maintain up to date documentation of the status verification system inquiry regarding each employee and must provide this information to the OWNER prior to beginning the project.



Delete Article 14.2 APPLICATION FOR PROGRESS PAYMENTS, Paragraph E in its entirety and replace with the following:

- E. **Retainage:** Payments will be made for work and labor performed and materials furnished under the contract according to the schedule of rates and prices and the specifications attached and made a part thereof. Partial payments under the contract will be made at the request of the CONTRACTOR once each month upon partial estimates by the ENGINEER, as hereinafter specified. There will be reserved and retained from monies earned by the CONTRACTOR, as determined by such monthly estimates, a sum equal to five (5) percent of all amounts of such estimates.
1. Cost of materials, properly stored, protected, and insured at the site of the work will be paid on monthly estimates only when so provided for in the special provisions, and then only for the specific materials listed therein for partial payment. In preparing the monthly estimates, advancement will be made therein for ninety percent (90%) of the cost of such materials, as evidenced by invoices to the CONTRACTOR. Advancement will not be made for any item of material amounting to less than five hundred dollars (\$500.00). All materials must conform to the requirements of the specifications; however, advancement for materials will not constitute acceptance, and any faulty material will be condemned although advancement may have been made for same in the estimates. Deductions at the same rates, and equal in amount to the advancements, will be made on the estimates as the material is used.
 2. Quantities used for progress estimates shall be considered only as approximate and provisional, and shall be subject to recalculation, adjustment, and correction by the ENGINEER in subsequent progress estimates and in final estimates. Inclusion of any quantities in progress estimates, or failure to disapprove the work at the time of progress estimate, shall not be construed as acceptance of the corresponding work or materials.
 3. In the event that an unforeseen condition beyond the control of the CONTRACTOR will materially delay the final completion of a contract and if the retention of the monies reserved will work undue hardship upon the CONTRACTOR, he may request payment of the retained percentage. If no claims have thus far been filed against the contract and if no taxes have been certified as due or about to become due by the State Tax Commission, the OWNER, at its discretion, may pay the retained percentage or so much of it as appears to be proper, but no payment shall be made until the CONTRACTOR will have delivered to the OWNER an acceptable bond in the full amount of the retained percentage thereupon released.
 4. Payment of the retained percentage shall be withheld for a period of thirty (30) days following the final acceptance by the OWNER, and shall be paid the CONTRACTOR at the expiration of said thirty (30) days in event no claims, as provided by law, have been filed against such funds; and provided further, that releases have been obtained from the Utah Labor Commission and also, except for contract totaling less than



\$20,000.00, the Utah State Tax Commission, the State of Utah Employment Security Department, and all other departments and agencies having jurisdiction over the activities of the CONTRACTOR. In the event such claims are filed, the CONTRACTOR shall be paid such retained percentages less an amount sufficient to pay any such claims, together with a sum sufficient to pay the cost of such action, and to cover attorney fees as determined by the OWNER.

END OF DOCUMENT



Provo City

Modifications to General Conditions

Rock Canyon Aquifer Storage Booster Station & Transmission Line 00 73 00M-10

PROVOEN202320182, Bid No. 1

REVISIONS, CLARIFICATIONS, AND MODIFICATIONS

**DOCUMENT 00 91 13
ADDENDA**

PART 1 GENERAL

1.1 PROCEDURE

- A. For filing purposes, add Addenda and Modifications to the Contract Documents following this page.

END OF DOCUMENT

**DOCUMENT 00 92 45
CHANGE ORDER FORM**

CHANGE ORDER No. _____

**Project: Rock Canyon Aquifer Storage Booster Station & Transmission Line
(PROVOEN202320182), Bid No. 1**

Date of Issuance:

Owner: Provo City Corporation

Contractor:

Owner's Rep:

Contact For: Barry Prettyman, P.E. - Project Engineer, Provo City Engineering Division

You are directed to make the following changes in the Contract Documents:

Description:

Purpose of Change Order:

Attachments:

Change in Contract Price:

Original Contract Price: \$

Prior Change Orders No. to No. _____

Contract Price with all approved Change Orders: \$ _____

Change to CONTRACT TIME:

The CONTRACT TIME will be increased by calendar days.

The date for completion of all work will be _____.
(Date)

Approvals Required:

To be effective, this order must be approved by the Federal Agency if it changes the scope or objective of the PROJECT, or as may otherwise be required by the SUPPLEMENTAL GENERAL CONDITIONS.

RECOMMENDED:

APPROVED:

ACCEPTED:

by _____
Project Manager

by _____
Owner

by _____
Contractor

END OF DOCUMENT



Provo City

Change Order Form

Rock Canyon Aquifer Storage Booster Station & Transmission Line 00 92 45-1

PROVOEN202320182, Bid No. 1

SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS

SECTION 01 11 00S SUMMARY OF WORK

Delete Standard Specification 01 11 00 in its entirety and replace it with the following:

PART 1 GENERAL

1.1 GENERAL

- A. The Work to be performed under this contract shall consist of furnishing all, tools, equipment, materials, supplies, and manufactured articles and furnishing all labor, transportation, and services including fuel, power, water, and essential communications, and performing all Work, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The Work shall be complete, and all work, materials, and services not expressly indicated or called for in the Contract Documents which may be necessary for the complete and proper construction of the Work in good faith shall be provided by the CONTRACTOR as though originally so indicated, at no increase in cost to the OWNER.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. For Bid Schedule 1, the Work generally includes, but is not limited to, the following:
1. Maintain the operation of the existing pump station until the new pump station, including all features required for pump operation and control, have been commissioned.
 2. Pump station construction including, all mechanical, electrical, plumbing, structural, civil, and architectural.
 3. Pipe connections to existing water mains at the pump station area.
 4. Commissioning of the system.
 5. Decommissioning and demolition of an existing pump station.
 6. Restoration of the site and adjacent streets, parking lots, and other facilities including implementing the site landscaping plan.
- B. For Bid Schedule 2, the Work generally includes, but is not limited to, the following:
1. Construction of water main and appurtenances from the intersection of Temple View Drive and Temple Hill Drive to Rock Canyon.
 2. One water main outlet in Rock Canyon.
 3. One valve vault located in Rock Canyon.
 4. Commissioning of the system.

5. Restoration of streets, boulevards, lawns, parking lots, and other facilities.

1.3 CONTRACT TYPE

- A. The Work hereunder shall be completed under a contract that includes lump sum pay items.

1.4 WORK BY OTHERS

- A. The CONTRACTOR shall cooperate fully with all utility forces of the OWNER or the forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the Work, and shall schedule the Work so as to minimize the interference with said relocation, altering or other rearranging of facilities.
- B. All surveying and construction staking will be performed by CONTRACTOR. The CONTRACTOR shall notify the ENGINEER of any surveying needs 72 hours prior to the anticipated work.

1.5 LIMITATION OF OPERATIONS

- A. No work is allowed between the hours of 10:00 PM and 7:00 AM without prior written approval from the ENGINEER.

1.6 CONTRACTOR USE OF PROJECT SITE

- A. The CONTRACTOR's use of the project site shall be limited to its construction operations within the construction work zone. This includes on-site storage of materials, on-site fabrication facilities, and field offices. Storage of project materials will not be permitted on public streets outside of the construction work zone.

1.7 OWNER USE OF THE PROJECT SITE

- A. The CONTRACTOR shall cooperate and coordinate with the OWNER to facilitate the OWNER's operations and to minimize interference with the CONTRACTOR's operations at the same time. In any event, the OWNER shall be allowed access to the project site during the period of construction.

1.8 STORM WATER POLLUTION PREVENTION

- A. The CONTRACTOR shall be responsible for implementation of Best Management Practices for the project to eliminate illicit discharge into the Storm Water System. The CONTRACTOR shall be responsible to obtain a Utah State General Construction Permit and prepare a Storm Water Pollution Prevention Plan if the area of disturbance is one acre or greater. If a Storm Water Pollution Prevention Plan is not provided with the

Contract Documents and the area of disturbance is less than one acre, the CONTRACTOR shall at a minimum:

1. Provide storm drain inlet protection.
2. Provide appropriate washout bins for all concrete trucks on the project.
3. Provide stabilized construction accesses to eliminate tracking of sediment onto surrounding streets.
4. Provide sweeping on a daily basis, or as directed by the ENGINEER, of the project area and surrounding streets. More frequent sweeping may be required depending on project situations.

1.9 PUBLIC NOTICING

- A. The CONTRACTOR shall provide a Public Relations Plan for the project and submit the plan to the OWNER at the pre-construction conference for approval. The Public Relations Plan shall address the following minimum requirements:
1. The CONTRACTOR shall provide a Public Relations Supervisor who is responsible for interfacing with the public throughout the project and resolving complaints and concerns of property/business owners and the public in general. The name and qualifications of the Public Relations Supervisor shall be identified in the Public Relations Plan and shall be presented to the ENGINEER at the pre-construction conference. The Public Relations Supervisor shall:
 - a. Be listed with name and phone number on all project flyers, notifications, and project signs.
 - b. Have a 24-hour access phone number to respond to construction complaints.
 - c. Have the authority to direct the Work as required to resolve concerns and complaints.
 - d. Provide an updated progress schedule to the ENGINEER on a weekly basis.
 - e. Provide an updated long-term progress schedule to the ENGINEER with each pay request.
 - f. Ensure all notifications to adjacent property owners are made as described in the Contract Documents.
 - g. Within 60 minutes of being notified, contact any property owners who have called with complaints or expressed concerns.
 - h. Resolve all complaints and expressed concerns within 24 hours.

- i. Follow-up with individuals or entities making complaints 24 hours after resolution to ensure that satisfactory results were obtained.
 - j. Document all complaints in a public relations log, including name, address, and contact information for the individual or entity, date and time of initial notification, nature of complaint, actions taken to resolve the complaint, date and time of complaint resolution, and the date and time of follow-up actions.
 - k. Provide an updated copy of the public relations log to the ENGINEER on a weekly basis.
2. The CONTRACTOR shall provide a professionally prepared, moveable, temporary project sign at each work location on the project. The sign shall have a minimum face area of 16 square feet and shall be readily visible and legible. A proof of the proposed sign shall be submitted to the ENGINEER for approval at the pre-construction conference. The sign shall contain the following information:
 - a. Project Name:
 - b. Contractor Name:
 - c. Public Relations Supervisor Name:
 - d. Public Relations Supervisor Contact Number:
3. Failure to comply with the approved Public Relations Plan shall be considered grounds for project suspension per Article 15.1 of the General Conditions (APWA Document 00 72 00).

END OF SECTION 01 11 00S

SECTION 01 14 19S
USE OF SITE

Add this Supplemental Specification to the Contract Documents

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. CONTRACTOR use of Site, including remote Sites

1.2 CONTRACTOR USE OF SITE

- A. Coordinate with ENGINEER and OWNER to limit operations, including materials and equipment storage, to the areas shown on the Plans and otherwise agreed upon prior to performance of the Work.
- B. Coordinate with ENGINEER and OWNER to identify property limits at the Site prior to commencement of any construction activity.
- C. When unfavorable weather, soil, drainage, or other unsuitable construction conditions exist, confine operations to tasks that will not be adversely affected by such conditions. No portion of the Work shall be constructed under conditions that would adversely affect the quality of the Work unless special means or precautions are taken to perform the Work in a proper and satisfactory manner.
- D. Coordinate with ENGINEER and OWNER to identify project Site access, parking, and staging areas. If additional access is desired, submit plan to OWNER for review and approval. Any access shall not disturb traffic on city streets. Any damage to existing pavements or ground surfaces caused by access shall be restored to pre-construction conditions prior to demobilization.
- E. OWNER approval is required prior to storing any materials on Site in areas not designated for that purpose on the Plans.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 14 19S

SECTION 01 22 00S
MEASUREMENT AND PAYMENT

Add this Supplemental Specification to the Contract Documents.

PART 1 GENERAL

1.1 GENERAL

- A. This Section of the Specifications describes the measurement and payment for the Work to be done under the items listed on the Bid Schedule (00 43 00).
- B. Each unit price or lump sum price stated on the Bid Schedule shall constitute full compensation as herein specified for each item of Work completed in accordance with the requirements of the Contract Documents including Plans and Specifications, including all cleanup and restoration.
- C. All costs in connection with the Work, including furnishing all materials, machinery, supplies and appurtenances; providing all construction equipment and tools; and performing all necessary labor, coordination, supervision, and management to fully complete the Work shall be included in the unit prices or unit lump sum prices on the Bid Schedule. All Work not specifically set forth as a separate bid item herein shall be considered a subsidiary obligation of CONTRACTOR and all costs in connection therewith shall be included in the amounts and prices submitted on the Bid Schedule. The price on the Bid Schedule shall include all Work necessary to make all of the Work come together including all connections (if any) between the various parts of the Work.

1.2 ESTIMATED QUANTITIES

- A. All estimated quantities for Unit Price items in the Bid Schedule are approximate and are to be used only as a basis for determining the initial Contract Price. The actual amount of Work to be done or materials to be furnished under the Unit Price items may differ from the estimated quantities. The basis of payment for Work or materials furnished or placed will be the actual quantities of Work performed or material furnished and placed. CONTRACTOR agrees to make no claim for damages, anticipated profits, or otherwise due to any difference between the quantities of Work actually performed or materials furnished and placed and the estimated quantities included in the Bid Schedule.
- B. A “(P)” designation on the Bid Schedule indicates that the item will be paid based on plan quantities. These items will not be measured in the field and CONTRACTOR will be paid based on the quantity shown on the Bid Schedule unless one or more of the following occurs:
 - 1. A contract revision alters or eliminates the quantity for a designated pay item.
 - 2. The quantity for a designated item varies by more than 5 percent from the pay quantity.



3. A quantity variation causes the value of the work under a designated bid item to vary by more than \$10,000 from the bid amount.
- C. If the actual quantities vary from the plan quantities denoted by “(P)” by more than the amount listed in 1.02 B 2 or 3, CONTRACTOR shall submit documentation of sufficient detail to ENGINEER to demonstrate that the actual quantities vary from plan.
- D. Units of measure shown on Bid Schedule to be as follows, unless specified otherwise.

Item	Method of Measurement
AC	Acres – Field Measure of area by OWNER's Representative
CY	Cubic Yards – Field Measure of volume by OWNER's Representative or (P) Plan quantity
BCY	Bank Cubic Yards – existing soil volume in-situ, field measure of volume by OWNER's Representative or Plan (P) quantity
ECY	Embankment Cubic Yards – in-place soil volume installed, field measure of volume by OWNER's Representative or Plan (P) quantity
EA	Each – Field Count by OWNER's Representative
GAL	Gallons – Measurement by volume from delivery tickets
LBS	Pounds – Measurement by weight from delivery tickets
LF	Lineal Foot – Field Measure by OWNER's Representative to the nearest whole foot or calculated from horizontal stationing shown on the Plans.
LS	Lump Sum – Unit is one: no measurement will be made
SF	Square Feet – Field measure of area by OWNER's Representative
SFF	Square Face Foot – Field measure of vertical face area by OWNER's Representative
SY	Square Yards – Field measure of area by OWNER's Representative
TON	Ton – In vehicle weight by delivery ticket

1.3 INTENT OF BID SCHEDULE ORGANIZATION

- A. Payment for all Work shall be in accordance with the terms and conditions set forth elsewhere in the Contract Documents and CONTRACTOR's Bid prices set forth in CONTRACTOR's Bid Schedule. The Bid items set forth in the Bid Schedule subdivide the Project for purposes of measurement and payment only and are intended to represent the entire and complete Project as set forth in the Contract Documents. Items not covered in the Bid items are to be considered incidental and therefore will not require additional payment. The Bid items set forth in the Bid Schedule shall constitute full compensation to CONTRACTOR for providing all supervision, labor, materials, equipment, tools and supplies, and overhead and profit to complete the Work in complete accordance with the Contract Documents.

- B. The following paragraphs provide additional descriptions of the Work included in each of the Bid items subject to the provisions of paragraphs 1.01, 1.02, and 1.03 of this Section.
1. Some of the Bid items are based on unit lump sum prices. Partial progress payment for those unit lump sum items shall be made in accordance with percent completed for each item based on the breakdown of the lump sum price in CONTRACTOR's conformed Bid Schedule.
 2. Other bid items are based on Unit Prices. For those items, progress payments shall be based on the actual quantities of each item of Work completed in accordance with the Contract Documents.
 3. The procedures for submitting and processing progress payments are set forth elsewhere in the Contract Documents.

1.4 BID ITEMS – BID SCHEDULES 1A AND 1B BOOSTER STATION

- A. Table 1 identifies the Bid Schedule 1 Booster Station bid item number, its description, Method of Measurement and Basis of Payment.
- B. The Method of Measurement in Table 1 identifies how each Bid Item will be measured.
- C. The Basis of Payment identifies the specific work items that are included in payment for this Bid Item. Payment for the unit(s) indicated in the Method of Measurement will be payment in full for the costs of all supervision, labor, materials, equipment, overhead and profit, and performing all operations as are necessary for the Bid Item, all complete as specified.
- D. Table 1

Schedule 1 Bid Item Number	Description	Method of Measurement	Basis of Payment These items include but are not limited to:
1	Mobilization/ Demobilization	A single lump sum (LS) unit. Note that payment of the bid item amount will be paid based on the Schedule of Values as Work is completed, except that not more than 90% of the bid item amount will be paid prior to Substantial Completion. Any unpaid balance will be paid with	<ol style="list-style-type: none"> a. Mobilizing and demobilizing people, materials, and equipment for the Work; b. CONTRACTOR's premium for performance and payment bonds and/or any special insurance obtained for this project; c. Equipment mobilization and demobilization; d. Furnishing, installing, and maintaining CONTRACTOR's facilities and overhead items; e. Providing work area security and coordinating work area access; f. Providing all safety measures, safety fencing and accommodating all safety requirements;

Schedule 1 Bid Item Number	Description	Method of Measurement	Basis of Payment These items include but are not limited to:
		the first payment after Substantial Completion.	<ul style="list-style-type: none"> g. Development, implementation, and maintenance of appropriate health and safety plan; h. Furnishing all sequencing and staging activities; i. Furnishing all temporary electrical, water, utility and telephone services required or needed by the CONTRACTOR to perform the Work; j. Attending all meetings and other communication activities required to coordinate with OWNER and ENGINEER; k. Site cleanup during execution of the Work and upon completion of the Work; l. Preparing and transmitting the required shop plans and submittals; m. Obtaining all permits required of the CONTRACTOR; n. Compliance with all project permits, including coordination, safety requirements, insurance requirements, and all other individual permit requirements; o. Identifying and locating utilities as necessary for the Work; p. Coordinating with utility companies; q. Coordinating and obtaining field-marked locations of existing on-site utilities; r. Preparing and submitting Project Record Documents; s. Furnishing, maintaining, and installing erosion and sediment control measures; t. and all Work associated with Mobilization/Demobilization.

Schedule 1 Bid Item Number	Description	Method of Measurement	Basis of Payment These items include but are not limited to:
2	Traffic Control	<p>A single lump sum (LS) unit.</p> <p>Note that payment for this bid item will be paid based on the Schedule of Values as Work is completed, except that not more than 90% of the bid item amount will be paid prior to Substantial Completion. Any unpaid balance will be paid with the first payment after Substantial Completion.</p> <p>Developing, implementing, and maintaining the trail control plan for the Work including all labor, equipment, signs, lighting and supplies.</p>	<p>Developing, implementing, and maintaining the traffic control plan for the Work including all labor, equipment, signs, lighting and supplies.</p>
3	SWPPP	<p>A single lump sum (LS) unit.</p> <p>Note that payment for this bid item will be paid based on the Schedule of Values as Work is completed, except that not more than 90% of the bid item amount will be paid prior to Substantial Completion. Any unpaid balance will be paid with the first payment</p>	<p>Developing, permitting, implementing, and maintaining the Stormwater Pollution Prevention Plan for the Work including all labor, equipment, and materials, including removal of sediment and restoring the site to pre-Work conditions.</p>

Schedule 1 Bid Item Number	Description	Method of Measurement	Basis of Payment These items include but are not limited to:
		after Substantial Completion.	
4	Construction Surveying	A single lump sum (LS) unit	All construction surveying required including but not limited to coordinating with OWNER-provided survey information and data, establishment of benchmarks and control points, field surveying of project features, construction staking, construction staking to lay out the dimensions and elevations of all Work items, maintaining records of construction surveying for record plans, maintenance of digital record plans of surveys performed, and all Work associated with construction surveying.
5	Quality Control	A single lump sum (LS) unit	All testing, re-testing (concrete, soil, pressure), furnishing all third-party reports, and coordinating quality control work.
6	Pump Station Structural	A single lump sum (LS) unit	Construction of the entire pump station structure, including all finishes, appurtenances (e.g., stairs, hatches, weatherproofing).
7	Pump Station Pumps and Interior Piping	A single lump sum (LS) unit	Furnishing, installing, and commissioning all pumps (including spares, sump pump), all piping, all valves, all joint restraints, all pipe supports, and all other appurtenances inside the pump station.
8	Pump Station Exterior Piping	A single lump sum (LS) unit	Furnishing and installing all piping, all valves, joint restraints, and all other appurtenances outside the pump station including all excavation and backfill.
9	Strawberry Vault	A single lump sum (LS) unit	Furnishing, installing (including excavation, backfilling and restoration), testing, and commissioning all equipment and other appurtenances that are part of the vault system.
10	Transmission Line Tie-in at Station 9+00	A single lump sum (LS) unit	Furnishing, installing (including excavation, backfilling, and restoration), cleaning, disinfecting, commissioning, and testing all connections, including related restrained joint pipe, fittings, and other appurtenances.
11	Pump Station HVAC	A single lump sum (LS) unit	Furnishing, installing, and commissioning all equipment required to heat, ventilate, and air-condition the pump station.
12	Pump Station Generator and Transfer Switch	A single lump sum (LS) unit	Furnishing, installing, and commissioning the back-up generator, transfer switch and all related equipment.

Schedule 1 Bid Item Number	Description	Method of Measurement	Basis of Payment These items include but are not limited to:
13	Pump Station Electrical Equipment	A single lump sum (LS) unit	Furnishing all electrical equipment including the service entrance panels, distribution panels, motor control center, lights, switches, and related equipment.
14	Pump Station Electrical Equipment Installation and Wiring	A single lump sum (LS) unit	Installing all the electrical equipment and instruments including furnishing, installing, and commissioning all wiring, raceways, conduit, communication cabling, pull boxes, junction boxes and other equipment required to make the pump station electrical equipment, instrumentation, lights, pumps, HVAC system and control system functional. This item includes coordination with the electric utility and all wiring between the electrical utility transformers and the pump station electrical equipment.
15	Exterior Fiber Optic Conduit	A single lump sum (LS) unit	Furnishing and installing (including excavation, backfilling, and restoration) of all communication conduit, fittings, fasteners, hardware, and appurtenances located outside of the Booster Station and between Stations 0+00 and 9+00.
16	Exterior Pull Boxes	These items will be measured as individual units.	Furnishing and installing (including excavation, backfilling, and restoration) of all pull boxes and appurtenances including fittings, fasteners, and hardware.
17	Demolition	A single lump sum (LS) unit	Furnishing all equipment, supplies, materials and labor to demolish the items indicated on the Drawings, salvage the items indicated on the Drawings, package the salvaged items and deliver the salvaged items to OWNER, and restore the site as indicated on the Drawings.
18	Pump Station Site Work	A single lump sum (LS) unit	Final grading and furnishing and installing all walks, driveways, curbs, gutters, topsoil, mulch, and sod.
19	Pump Station Landscaping	A single lump sum (LS) unit	Furnishing and installing all shrubs, trees, and plants.

1.5 BID ITEMS – BID SCHEDULES 2A AND 2B TRANSMISSION LINE

- A. Table 2 identifies the Bid Schedule 2 Transmission Line bid item number, its description, Method of Measurement and Basis of Payment.
- B. The Method of Measurement in Table 2 identifies how each Bid Item will be measured.

C. The Basis of Payment identifies the specific work items that are included in payment for this Bid Item. Payment for the unit(s) indicated in the Method of Measurement will be payment in full for the costs of all supervision, labor, materials, equipment, overhead and profit, and performing all operations as are necessary for the Bid Item, all complete as specified.

D. Table 2

Schedule 2 Bid Item Number	Description	Method of Measurement	Basis of Payment These items include but are not limited to:
1	Mobilization/ Demobilization	A single lump sum (LS) unit. Note that payment of the bid item amount will be paid based on the Schedule of Values as Work is completed, except that not more than 90% of the bid item amount will be paid prior to Substantial Completion. Any unpaid balance will be paid with the first payment after Substantial Completion.	See Table 1 (Bid Schedule 1) Bid Item Number 1
2	Traffic / Trail Control Plan	A single lump sum (LS) unit	Developing, permitting and implementing the traffic control plan and the Trail control plan for the Work including all labor, equipment, lighting and supplies.
3	SWPPP	A single lump sum (LS) unit	Developing, permitting, implementing, and maintaining the Stormwater Pollution Prevention Plan for the Work including all labor, equipment, and materials, including removal of sediment and restoring the site to pre-Work conditions.

Schedule 2 Bid Item Number	Description	Method of Measurement	Basis of Payment These items include but are not limited to:
4	Construction Surveying	A single lump sum (LS) unit	All construction surveying required including but not limited to coordinating with OWNER-provided survey information and data, establishment of benchmarks and control points, field surveying of project features, construction staking, construction staking to lay out the dimensions and elevations of all Work items, maintaining records of construction surveying for record Drawings, maintenance of digital record of surveys performed, and all Work associated with construction surveying.
5	Quality Control	A single lump sum (LS) unit	All testing, re-testing (concrete, soil, pipe exfiltration), furnishing all third-party reports, and coordinating quality-control work.
6	6" DIP	These pipe items will be measured to the nearest lineal foot from beginning to end of the specified pipe diameter including all bends, valves, and fittings. Reducers will be measured using the greatest pipe diameter.	Furnishing, installing (including excavation, backfilling and restoration), cleaning, disinfecting, commissioning, and testing all pipes, fittings, bends, joint restraints, and other appurtenances.
7	16" DIP		
8	24" DIP		
9	Connections at Stations 38+00 & 44+50	These items will be measured as individual units.	Furnishing, installing (including excavation, backfilling, and restoration), cleaning, disinfecting, commissioning, and testing all connections, including related restrained joint pipe, fittings, and other appurtenances. Also includes connecting to existing tracer wire and conduit for fiber optic
10	Hydrants	These items will be measured as individual units.	Furnishing, installing (including excavation, backfilling, and restoration), cleaning, disinfecting, commissioning, and testing of all hydrants including related valves, restrained joint pipe, fittings, bends and other appurtenances. There will also be payment for piping, valves, and bends
11	6" Gate Valve		Furnishing, installing (including excavation, backfilling, and restoration), cleaning, disinfecting, commissioning, and testing all valves and valve risers of each size
12	24" Butterfly Valve		

Schedule 2 Bid Item Number	Description	Method of Measurement	Basis of Payment These items include but are not limited to:
			including related restrained joint pipe, fittings, and other appurtenances.
13	ASR North Discharge	A single lump sum (LS) unit	Furnishing, installing the ASR North Discharge system including riprap, geotextile and modifying the existing channel, restoration and disposal of excess soil.
14	24" Valve Vault	A single lump sum (LS) unit	Furnishing, installing (including excavation, backfilling, and restoration), testing, and commissioning all equipment and other appurtenances that are part of the valve vault system.
15	Electrical Equipment Installation and Wiring	A single lump sum (LS) unit	Furnishing, installing (including excavation, backfilling, and restoration), testing and commissioning all equipment, wiring, conduit for electrical wiring and other appurtenances that are part of the electrical and control system.
16	Conduit for Fiber Optic	This item will be measured to the nearest lineal foot from beginning to end	Furnishing and installing (including excavation, backfilling, and restoration) of all conduit for future fiber optic cabling including pull boxes, fittings, fasteners, hardware and appurtenances.
17	Pull Boxes	This item will be measured as individual units	Furnishing and installing (including excavation, backfilling, and restoration) of all electrical - communication pull boxes and appurtenances including fittings, fasteners, and hardware.
18	Water Service Replacement	This item will be measured as individual units (EA).	Furnishing, installing (including excavation, backfilling, and restoration), cleaning, disinfecting, commissioning, and testing all pipes, fittings, bends, and other appurtenances between the existing water main and the existing service water meter.
19	Water Main Relocation	This item will be measured as individual units (EA).	Furnishing, installing (including excavation, backfilling, and restoration), cleaning, disinfecting, commissioning, and testing all pipes, fittings, bends, and other appurtenances required for relocating existing water mains to permit construction of the transmission line.

Schedule 2 Bid Item Number	Description	Method of Measurement	Basis of Payment These items include but are not limited to:
20	Pavement Removal and Bituminous Replacement	This item will be measured to the nearest 0.1 ton based on weigh tickets from an OWNER – CONTRACTOR mutually agreeable scale that is used to weigh plant mixed bituminous used for street paving and restoration.	All labor, equipment, supplies and materials to remove the existing pavement structure including aggregate base and granular borrow, proper dispose of the removed pavement, stockpiling and re-using aggregates (or providing new aggregate base), and replace – restore the pavement structure including aggregate base and granular borrow as shown on the Drawings, Standard Details and Standard Drawings.
21	Imported Trench Zone Backfill	This item will be measured to the nearest 0.1 ton based on weigh tickets from an OWNER – CONTRACTOR mutually agreeable scale that is used to weigh trench zone backfill aggregates used for backfilling.	All labor, equipment, supplies, and materials required to remove and dispose of unsuitable trench zone backfill materials as determined by OWNER or ENGINEER, and to furnish, place and compact imported trench zone materials. Payment for other imported or native materials (including furnishing, placing and compacting) required for trench backfill and surface restoration (pipe base materials, pipe zone materials and roadway zone materials; see Standard Detail P-255) shall be incidental to or included in other Bid Items.
22	Rock Removal	This item will be measured to the nearest lineal foot (LF) from the beginning to the end of each rock removal section as defined by when additional equipment is required to excavate the trench due to the presence of rock.	Furnishing all additional equipment, labor and supplies required to remove rock to the lines and grades shown on the Drawings including Standard Drawings and Details and to dispose of the removed rock.
23	Transmission Line Tie-in at Station 9+00	This item will be measured as individual unit.	Furnishing, installing (including excavation, backfilling, and restoration), cleaning, disinfecting, commissioning, and testing all connections, including related restrained joint pipe, fittings, and other appurtenances.
24	Tie-in to 16” DIP near Station 63+60		Furnishing, installing (including excavation, backfilling, and restoration), cleaning, disinfecting, commissioning, and testing all connections, including related restrained joint pipe, fittings, and other appurtenances.

END OF SECTION 01 22 00S

SECTION 01 31 13S COORDINATION

Add the following at the end of Standard Specification 01 31 13 Part 1.

1.8 PROGRESS MEETINGS

Weekly progress meetings will be scheduled by OWNER or ENGINEER at a regular time mutually agreeable to OWNER, CONTRACTOR, and ENGINEER. Meetings will normally be held at the Site.

Each Application for Payment may be reviewed during one Progress Meeting each month prior to CONTRACTOR's submittal.

Attend all meetings and coordinate the attendance of subcontractors whose Work may be in progress at the time, or whose presence may be required for any purpose.

1.9 PRE-INSTALLATION MEETINGS

Pre-installation meetings will be scheduled by CONTRACTOR a minimum of one week prior to Work requiring such meetings being performed.

Attendees at these meetings shall include CONTRACTOR, installing Subcontractor (as needed), Supplier (as needed), OWNER, and ENGINEER.

Meeting agenda items will include, but are not limited to, schedule and sequence, mock-up construction, product delivery and storage, material compatibility, Site restrictions, and coordination of any required testing and observation.

1.10 UNSCHEDULED MEETINGS

Attend unscheduled meetings that may be reasonably requested by ENGINEER or OWNER.

1.11 AFTER HOUR CONTACTS

Prior to beginning any Work at the Site, submit to ENGINEER the names of at least three (3) employees of CONTRACTOR who may be contacted after normal working hours in the event of an unanticipated condition requiring immediate attention.

At least one person should be available at all times for immediate response to the Site within two hours of being called. That person shall have authority to make field decisions for CONTRACTOR.

END OF SECTION 01 31 13S

SECTION 01 33 00S SUBMITTAL PROCEDURES

Delete Standard Specification 01 33 00 SUBMITTAL PROCEDURES in its entirety and replace it with the following.

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes submittal procedures.

1.2 GENERAL SUBMITTAL PROCEDURES

- A. Transmit via email a PDF copy of each submittal labeled with Unique Project Name, name of the submittal, and Specification Section and page number of these Contract Documents in which the submittal was requested. Indicate the type or purpose of the submittal, as more fully described elsewhere in this Section with regard to the Schedule of Submittals. A transmittal letter stating the same information shall accompany each submittal.
- B. Transmit all submittals to ENGINEER at the email addresses given below:
 - 1. Barry Prettyman – bprettyman@provo.org
 - 2. Al Fandrey – afandrey@barr.com
- C. Apply CONTRACTOR's stamp, signed or initialed certifying that review and verification of products required, field dimensions, adjacent construction activities, and coordination of information, is in accordance with the requirements of the Work and Contract Documents. Unstamped or unsigned submittals and submittals that have not been thoroughly checked by CONTRACTOR will be returned without action. Submittals from Subcontractors or vendors will be returned without action.
- D. Schedule submittals to expedite the Work, and in accordance with the Schedule of Submittals to be prepared by CONTRACTOR. Coordinate submission of related items.
- E. Identify all variations or deviations from the Contract Documents and identify alternative products or system limitations that may be detrimental to successful performance of the completed Work.
- F. Provide an area for CONTRACTOR and ENGINEER review, stamps, and comments.
- G. Revise and resubmit submittals as required. Identify all changes made since previous submittal. Completion date extensions will not be granted for required submittal revisions.

- H. Promptly distribute reviewed submittals to Subcontractors, Suppliers, and other concerned parties. Instruct parties to promptly report any inability to comply with provisions.
- I. Do not proceed with any Work requiring review by ENGINEER until submittals have been reviewed and returned to CONTRACTOR.
- J. All submittals that are made that are not specifically required by the Contract Documents will be returned without action.

1.3 SUBMITTAL OF TEST RESULTS AND CERTIFICATES (TYPE A)

- A. When required in individual sections of these Specifications, or when required by reference specification, submit manufacturer's certificates and/or test results.
- B. Indicate that material or product conforms to or exceeds the specified requirements and submit supporting data and affidavits.
- C. When material or product meets Specifications, no action by ENGINEER is necessary.

1.4 SUBMITTAL OF MANUFACTURER'S PRODUCT DATA WHEN REQUESTED FOR INFORMATIONAL PURPOSES (TYPE B)

- A. When required in individual sections of these Specifications, submit manufacturer's product data requested.
- B. Mark each copy neatly to identify applicable products, models, options, and other data. Identify conflicts between manufacturer's instructions and Contract Documents.
- C. When material or product meets requirements of Contract Documents, no action by ENGINEER is necessary.

1.5 SUBMITTAL OF SHOP DRAWINGS (TYPE C)

- A. When required in these Specifications, submit Shop Drawings in accordance with the Schedule of Submittals.
- B. The data shown on the Shop Drawings shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show ENGINEER that the materials and equipment CONTRACTOR proposes to provide meet the requirements of the Contract Documents and to enable ENGINEER to review the information for the limited purposes indicated below.
- C. Before submitting each Shop Drawing:
 - 1. Determine, verify, and note all field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information;
 - 2. Determine all issues regarding fitness for intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the Work;

3. Determine all information relative to CONTRACTOR's sole responsibilities in respect of means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incident thereto; and
 4. Review and coordinate each Shop Drawing with other Shop Drawings and with the requirements of the Work and the Contract Documents. Any disclaimers on CONTRACTOR's stamp or otherwise stated by CONTRACTOR on Shop Drawings shall not limit CONTRACTOR's responsibilities.
- D. ENGINEER will review, make notations as appropriate, stamp, and return submittals to CONTRACTOR. ENGINEER's stamp and CONTRACTOR's required action are described below:
1. APPROVED. CONTRACTOR may proceed without further action.
 2. APPROVED AS NOTED:
 - a. RESUBMITTAL NOT REQUIRED. CONTRACTOR shall review ENGINEER's notations and revise subject of submittal as required to conform to the requirements of the Drawings and Specifications before proceeding with the Work. Then, CONTRACTOR may proceed without further action.
 - b. REVISE AND RESUBMIT. CONTRACTOR shall review ENGINEER's notations and revise subject of submittal as required to conform to the requirements of the Drawings and Specifications before proceeding with the Work. Then, CONTRACTOR shall submit a revised copy of the submittal and may proceed without further action.
 3. NOT APPROVED (RESUBMIT). CONTRACTOR shall review ENGINEER's notations, revise subject of submittal as required to conform to the requirements of the Drawings and Specifications and resubmit to ENGINEER for additional action.
 4. NOT REVIEWED. ENGINEER has not reviewed the submittal but will keep the submittal with the project records.
- E. No Work shall be performed in connection with the fabrication or manufacture of equipment and materials until the data therefor have been reviewed by ENGINEER except at CONTRACTOR's own risk and responsibility. Work may proceed when submittals have been returned marked APPROVED or APPROVED AS NOTED, provided the Work is performed in accordance with ENGINEER's notations.
- F. 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. ENGINEER's review will not extend to those areas that CONTRACTOR is responsible for above. 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. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions. ENGINEER's review

and approval of Shop Drawings shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents.

- G. ENGINEER will review and return via email to CONTRACTOR within fourteen (14) calendar days following receipt. Do not proceed with related Work until approved submittal is returned.
- H. If ENGINEER's comments require resubmittal, make the revisions indicated and resubmit as for an original submittal. ENGINEER will review as for an original submittal.
- I. If ENGINEER's comments do not require resubmittal, make the revisions indicated and transmit to ENGINEER, via email, one clean first generation copy suitable for reproduction. This original shall bear CONTRACTOR's certification in accordance with the requirements of the General Conditions.
- J. Following preparation and submittal of final corrected reproducible, CONTRACTOR shall reproduce and distribute to Subcontractors and/or Suppliers.
- K. If actual installation does not conform to approved Shop Drawings, notify ENGINEER immediately on discovery. Revise approved Shop Drawings to note revisions and date discovered and submit with record documents.

1.6 RECORD DOCUMENT (TYPE D)

- A. Submit all record documents (or clearly legible copies) prior to Final Completion.
- B. Record documents consist of all Drawings, Specifications, Addenda, Change Orders, and Shop Drawings legibly annotated to reflect all changes made during construction.
- C. ENGINEER will not review the submittal but will keep the submittal with the project records.

1.7 SUBMITTAL OF SAMPLES (TYPE E)

- A. When required in individual sections of these Specifications, submit the number of samples of materials, finishes, colors, as required.
- B. Submit samples to illustrate functional and aesthetic characteristics of product, with integral parts and attachment devices. Coordinate with submittals for interfacing Work.
- C. Submit samples of finishes from the full range of manufacturer's standard colors (or in custom colors if required), textures, and patterns for ENGINEER or OWNER selection.
- D. ENGINEER will return one sample of selected material or finish or will provide written comment on submitted material.

1.8 SUBMITTAL OF OPERATION AND MAINTENANCE INSTRUCTIONS (TYPE F)

- A. Submit operation and maintenance instructions for all equipment and systems furnished.

- B. Operating instructions shall be prepared specifically for each system or piece of equipment installed under this contract and shall consider the specific equipment and controls included.
- C. All references, pictures, and diagrams regarding items not part of furnished equipment and systems shall be deleted. Instructions shall be complete for each separate system and shall cover:
 - 1. Equipment functions, normal operating characteristics, and limiting conditions.
 - 2. Assembly, installation, alignment, adjustment, and checking instructions.
 - 3. Operating instructions for start-up routine and normal operation: regulations and control; shutdown; and emergency conditions.
 - 4. Lubrication and maintenance schedules and instructions.
 - 5. Guide to “troubleshooting.”
 - 6. Parts list with manufacturer’s part numbers and parts diagrams.
 - 7. Outline, cross sections, and assembly drawings; engineering data; and wiring diagrams.
 - 8. Test data and performance curves, where applicable.
- D. Submittal of operation and maintenance instructions shall be made prior to Final Completion.
- E. When operation and maintenance instructions meet requirements of Contract Documents, no action by ENGINEER is necessary.

1.9 PRODUCT WARRANTY SUBMITTAL REQUIREMENTS (TYPE H)

- A. Manufacturer’s product warranty submittals shall be submitted in conformance with the applicable requirements of this Section and the individual specification Sections.

1.10 ALTERNATE PRODUCTS

- A. If CONTRACTOR proposes to use substitute products, then CONTRACTOR shall submit written application as required by the General Conditions and these Specifications.
- B. Submit copies of literature, drawings, and any other data necessary to substantiate that proposed substitute is equivalent or equal to the item named, and otherwise meets the conditions established in the General Conditions and these Specifications.
- C. Do not proceed with product installation or use until written approval by ENGINEER is received in accordance with the General Conditions and these Specifications.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION 01 33 00S

SECTION 01 35 00S SPECIAL PROVISIONS

Add this Specification to the Contract Documents.

PART 1 GENERAL

1.1 SUMMARY

- A. This Specification outlines OWNER's Project delivery plans for the entire Project of which the Work is a part.
- B. This Specification identifies items that OWNER would like to bring to CONTRACTOR's attention as these items may be different from typical work of this type.
- C. This Specification outlines Base Bid equipment requirements and how CONTRACTOR may propose providing equal equipment.

1.2 HOW THIS WORK FITS INTO THE ENTIRE PROJECT

- A. The entire Project includes the Work included in these Contract Documents, plus the construction of a new water main from near the pipe discharge point of this project to the Rock Canyon Tank (**Rock Canyon Tank Fill Line; PROVOEN202321687**). The Work includes a connection to this new water main.
- B. The Rock Canyon Tank Fill Line project bids are to be submitted by 4:00 pm local time on September 7, 2023.

1.3 SEQUENCE OF OPERATIONS, SPECIAL COORDINATION AND SPECIAL PROCEDURES

- A. CONTRACTOR will need to coordinate with the **Rock Canyon Tank Fill Line (PROVOEN202321687)** Contractor. This coordination will include:
 - 1. Coordination regarding the likely schedule of water main construction at the connection between the two projects.
 - 2. Pipe type and location (e.g., depth) at the connection.
 - 3. Coordination regarding restoration in the connection area.
 - 4. Coordination regarding commissioning of both projects.
 - 5. Coordination regarding the location of the termination of the fiber optic cable conduit.

- B. Depending on CONTRACTOR's schedule for the Work and the Rock Canyon Tank Fill Line contractor's work schedule, some Work items may be deleted from the Work.
 - 1. The Bid Schedule 2 Tie-in to Existing 16" DIP near Station 63+60 work may be deleted if this pipe is not yet installed when CONTRACTOR is ready to make this connection.
- C. Bid Schedule 1 and Bid Schedule 2 Contractor Coordination
 - 1. The Bid Schedule 1 and Bid Schedule 2 Contractors will need to coordinate regarding the transmission line connection at Station 9+00. The connection work will be deleted from one of the Bid Schedules, depending on which contractor makes the connection.
 - 2. The Bid Schedule 1 and Bid Schedule 2 Contractors will need to coordinate regarding traffic management.

1.4 CONNECTIONS TO EXISTING TRANSMISSION LINE AT STATION 38+00 & STATION 44+50

- A. To avoid disturbance of new surface construction, OWNER will install 24" PVC transmission line between about Stations 38+00 and 44+50 by about July 15, 2023.
- B. CONTRACTOR shall connect to this 24" PVC pipe and include this OWNER-installed pipe in all commissioning and testing work. This also includes connections to the OWNER installed tracer wires and conduit for fiber optic.
- C. OWNER will be responsible for all corrections required for this OWNER-installed 24" PVC pipe to meet all testing and commissioning requirements. OWNER may use CONTRACTOR's assistance with any corrective work on this section of transmission line and that corrective work will be included in an OWNER-initiated Change Order.

1.5 PIPE, FITTINGS, VALVES, GASKETS, ETC. PRESSURE RATINGS

- A. Pipes, fittings, valves, gaskets, flanges and similar are designed and produced in accordance with many and various specifications and it can be confusing.
- B. The Specifications (including Supplemental Specifications) and Drawings describe what is required for the Work.
- C. In summary, the working pressure for the Booster Station piping on the discharge side of the pumps is 350 psi. For flanged pipe, this working pressure will require special gaskets. This working pressure requires fittings and hydrants with a greater pressure rating than the fittings and hydrants in OWNER's Standard Specifications.
- D. The working pressure at the portion of the Work at the higher elevations is much less and OWNER's Standard Specifications are generally not supplemented in this area.
- E. The working pressure at the intermediate elevations results in the need to modify some of OWNER's Standard Specifications.

- F. The design working pressure in on the Drawings and this pressure is also used in the Supplemental Specifications to describe requirements for pipe, fittings, valves, gaskets, etc.
- G. Contact OWNER or ENGINEER for additional information and with questions.

1.6 BASE BID AND EQUIPMENT ALTERNATIVES

- A. OWNER has selected the equipment shown on the Drawings in part to minimize spare parts inventory and to have the ability to move/use these features at additional locations.
- B. CONTRACTOR's Bid shall be based on furnishing and installing the specified equipment.
- C. CONTRACTOR may offer a deduct for using equal equipment provided by different suppliers. CONTRACTOR shall complete Schedule 6 on the Bid Schedule (00 43 00) if CONTRACTOR desires to use alternative equipment. The substituted equipment shall be of equal performance and quality. OWNER will make the final decision on equipment.

1.7 STORAGE OF DURABLE MATERIALS AND SUPPLIES ON OWNER'S PROPERTY

- A. OWNER will permit the temporary outdoor storage of durable materials and supplies that will be incorporated into the Work on OWNER's property at 1377 South 350 East.
- B. CONTRACTOR shall be completely and solely responsible for the delivery, removal, protection, and preservation of all items stored on OWNER's property including insuring the stored materials for all losses.

1.8 BABA ACT REQUIREMENTS AND DOCUMENTATION

- A. All equipment and construction materials may need to comply with the Build America Buy America Act (BABAA; see 00 45 15 Federal Requirements and 00 21 13 Instructions to Bidders).
- B. Compliance Documentation by CONTRACTOR, Subcontractors, Manufacturers and Suppliers
 1. Compliance documentation and certifications shall be consistent with BABAA Best Practices, Documenting Compliance with Build America, Buy America Act (BABAA) Requirements (FEMA, January 2023). This document is at the end of this Supplemental Specifications.
 2. CONTRACTOR shall coordinate with OWNER and ENGINEER regarding the details of this documentation including providing draft certifications for OWNER's review.

1.9 PERMITS, PERMIT FEES AND PERMIT REQUIREMENTS

- A. OWNER has obtained a US Department of Agriculture Forest Service Permit for this work. This permit is at the end of this Supplemental Specification. CONTRACTOR shall comply with all provisions of this permit.
- B. OWNER has obtained a Utah Stream Alterations Permit (Order of the State Engineer) for this work. This permit is at the end of this Supplemental Specification. CONTRACTOR shall comply with all provisions of this permit.
- C. CONTRACTOR shall obtain and pay for all City of Provo required permits including permits for Traffic Control Plan, Street Closure and Asphalt Paving (see <https://provo.municipal.codes/Code/CFS>).
- D. CONTRACTOR shall prepare and submit a Stormwater Pollution Prevention Plan (SWPPP) permit application and obtain the SWPPP permit. CONTRACTOR shall pay for this permit. Also see 01 50 00S Temporary Facilities and Controls.
- E. OWNER will obtain all other permits required for construction and commissioning of the Work.
- F. CONTRACTOR shall meet all reasonable requirements – conditions of all permits required to construct and commission the Work including restoration.

1.10 CONSTRUCTION WATER

- A. CONTRACTOR may obtain water required for the construction, commissioning, and restoration of the Work. CONTRACTOR will need to pay for this water per OWNER's standard rates.

1.11 TRAIL RESTORATION

- A. The existing trail system will be extended and upgraded during 2023. This will likely occur before CONTRACTOR begins construction in this area.
- B. OWNER believes the improved trail system impacted by the Work may be successfully resorted by salvaging, replacing, and compacting the trail system aggregate surface and underlying aggregate base.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 35 00S

Authorization ID: PLG103002
 Contact Name: PROVO CITY CORPORATION
 Expiration Date: 12/31/2040
 Use Code: 915, 935, 643, 931

FS-2700-4 (VER. 03/17)
 OMB 0596-0082

**U.S. DEPARTMENT OF AGRICULTURE
 FOREST SERVICE**

SPECIAL USE PERMIT

Authority: FEDERAL LAND POLICY AND MGMT ACT, AS AMENDED October 21, 1976

PROVO CITY CORPORATION of Water Resources Department ATTN: RYAN YORK 1377 SOUTH 350 EAST PROVO UT 84606 (hereinafter "the holder") is authorized to use or occupy National Forest System lands in the UINTA-WASATCH-CACHE NATIONAL FOREST or Salt Lake Ranger District unit of the National Forest System, subject to the terms and conditions of this special use permit (the permit).

This permit covers 5.82 acres or 0 miles in the Sec. 18, T. 6 S., R. 3 E., SALT LAKE MERIDIAN, Sec. 28, T. 5 S., R. 3 E., SALT LAKE MERIDIAN, Sec. 27, T. 5 S., R. 3 E., SALT LAKE MERIDIAN, Sec. 29, T. 5 S., R. 3 E., SALT LAKE MERIDIAN, Sec. 17, T. 6 S., R. 3 E., SALT LAKE MERIDIAN, ("the permit area"), as shown on the map attached as Appendix A. This and any other appendices to this permit are hereby incorporated into this permit.

This permit issued for the purpose of:

Operate and maintain a water collection (6 spring collection boxes in 4 fenced areas as well as 4 access boxes), transmission lines (10 and 12 inch pipe), and storage facilities located within Rock Canyon, Cullinary Water system consisting of a 500,000 gallon water tank and a groundwater monitoring well.
 Powerline ROW corridor is 20ft Wide X 1350ft Long and the 120V line is buried and necessary access roads.

TERMS AND CONDITIONS

I. GENERAL TERMS

A. AUTHORITY. This permit is issued pursuant to the FEDERAL LAND POLICY AND MGMT ACT, AS AMENDED October 21, 1976 and 36 CFR Part 251, Subpart B, as amended, and is subject to their provisions.

B. AUTHORIZED OFFICER. The authorized officer is the Forest or Grassland Supervisor or a subordinate officer with delegated authority.

C. TERM. This permit shall expire at midnight on 12/31/2040.

D. CONTINUATION OF USE AND OCCUPANCY. This permit is not renewable. Prior to expiration of this permit, the holder may apply for a new permit for the use and occupancy authorized by this permit. Applications for a new permit must be submitted at least 6 months prior to expiration of this permit. Issuance of a new permit is at the sole discretion of the authorized officer. At a minimum, before issuing a new permit, the authorized officer shall ensure that (1) the use and occupancy to be authorized by the new permit is consistent with the standards and guidelines in the applicable land management plan; (2) the type of use and occupancy to be authorized by the new permit is the same as the type of use and occupancy authorized by this permit; and (3) the holder is in compliance with all the terms of this permit. The authorized officer may prescribe new terms and conditions when a new permit is issued.

E. AMENDMENT. This permit may be amended in whole or in part by the Forest Service when, at the discretion of the authorized officer, such action is deemed necessary or desirable to incorporate new terms that may be required by law, regulation, directive, the applicable forest land and resource management plan, or projects and activities implementing a land management plan pursuant to 36 CFR Part 215.

F. COMPLIANCE WITH LAWS, REGULATIONS, AND OTHER LEGAL REQUIREMENTS. In exercising the rights and privileges granted by this permit, the holder shall comply with all present and future federal laws and regulations and all present and future state, county, and municipal laws, regulations, and other legal requirements that apply to the permit area, to the extent they do not conflict with federal law, regulation, or policy. The Forest Service assumes no responsibility for enforcing laws, regulations, and other legal requirements that fall under the jurisdiction of other governmental entities.

G. NON-EXCLUSIVE USE. The use or occupancy authorized by this permit is not exclusive. The Forest Service reserves the right of access to the permit area, including a continuing right of physical entry to the permit area for inspection, monitoring, or any other purpose consistent with any right or obligation of the United States under any law or regulation. The Forest Service reserves the right to allow others to use the permit area in any way that is not inconsistent with the holder's rights and privileges under this permit, after consultation with all parties involved. Except for any restrictions that

the holder and the authorized officer agree are necessary to protect the installation and operation of authorized temporary improvements, the lands and waters covered by this permit shall remain open to the public for all lawful purposes.

H. ASSIGNABILITY. This permit is not assignable or transferable.

I. TRANSFER OF TITLE TO THE IMPROVEMENTS.

1. **Notification of Transfer.** The holder shall notify the authorized officer when a transfer of title to all or part of the authorized improvements is planned.

2. **Transfer of Title.** Any transfer of title to the improvements covered by this permit shall result in termination of the permit. The party who acquires title to the improvements must submit an application for a permit. The Forest Service is not obligated to issue a new permit to the party who acquires title to the improvements. The authorized officer shall determine that the applicant meets requirements under applicable federal regulations.

II. IMPROVEMENTS

A. LIMITATIONS ON USE. Nothing in this permit gives or implies permission to build or maintain any structure or facility or to conduct any activity, unless specifically authorized by this permit. Any use not specifically authorized by this permit must be proposed in accordance with 36 CFR 251.54. Approval of such a proposal through issuance of a new permit or permit amendment is at the sole discretion of the authorized officer.

B. PLANS. All plans for development, layout, construction, reconstruction, or alteration of improvements in the permit area, as well as revisions to those plans must be prepared by a professional engineer, architect, landscape architect, or other qualified professional based on federal employment standards acceptable to the authorized officer. These plans and plan revisions must have written approval from the authorized officer before they are implemented. The authorized officer may require the holder to furnish as-built plans, maps, or surveys upon completion of the work.

III. OPERATIONS.

A. PERIOD OF USE. Use or occupancy of the permit area shall be exercised at least 365 days each year.

B. CONDITION OF OPERATIONS. The holder shall maintain the authorized improvements and permit area to standards of repair, orderliness, neatness, sanitation, and safety acceptable to the authorized officer and consistent with other provisions of this permit. Standards are subject to periodic change by the authorized officer when deemed necessary to meet statutory, regulatory, or policy requirements or to protect national forest resources. The holder shall comply with inspection requirements deemed appropriate by the authorized officer.

C. OPERATING PLAN. The holder shall prepare and annually revise by Date an operating plan. The operating plan shall be prepared in consultation with the authorized officer or the authorized officer's designated representative and shall cover all operations authorized by this permit. The operating plan shall outline steps the holder will take to protect public health and safety and the environment and shall include sufficient detail and standards to enable the Forest Service to monitor the holder's operations for compliance with the terms and conditions of this permit. The operating plan shall be submitted by the holder and approved by the authorized officer or the authorized officer's designated representative prior to commencement of operations and shall be attached to this permit as an appendix. The authorized officer may require an annual meeting with the holder to discuss the terms and conditions of the permit or operating plan, annual use reports, or other concerns either party may have.

D. MONITORING BY THE FOREST SERVICE. The Forest Service shall monitor the holder's operations and reserves the right to inspect the permit area and transmission facilities at any time for compliance with the terms of this permit. The holder shall comply with inspection requirements deemed appropriate by the authorized officer. The holder's obligations under this permit are not contingent upon any duty of the Forest Service to inspect the permit area or transmission facilities. A failure by the Forest Service or other governmental officials to inspect is not a justification for noncompliance with any of the terms and conditions of this permit.

IV. RIGHTS AND LIABILITIES

A. LEGAL EFFECT OF THE PERMIT. This permit, which is revocable and terminable, is not a contract or a lease, but rather a federal license. The benefits and requirements conferred by this authorization are reviewable solely under the procedures set forth in 36 CFR 214 and 5 U.S.C. 704. This permit does not constitute a contract for purposes of the Contract Disputes Act, 41 U.S.C. 601. The permit is not real property, does not convey any interest in real property, and may not be used as collateral for a loan.

B. VALID EXISTING RIGHTS. This permit is subject to all valid existing rights. Valid existing rights include those derived under mining and mineral leasing laws of the United States. The United States is not liable to the holder for the exercise of any such right.

C. ABSENCE OF THIRD-PARTY BENEFICIARY RIGHTS. The parties to this permit do not intend to confer any rights on any third party as a beneficiary under this permit.

D. SERVICES NOT PROVIDED. This permit does not provide for the furnishing of road or trail maintenance, water, fire protection, search and rescue, or any other such service by a government agency, utility, association, or individual.

E. RISK OF LOSS. The holder assumes all risk of loss associated with use or occupancy of the permit area, including but not limited to theft, vandalism, fire and any fire-fighting activities (including prescribed burns), avalanches, rising waters, winds, falling limbs or trees, and other forces of nature. If authorized temporary improvements in the permit area are destroyed or substantially damaged, the authorized officer shall conduct an analysis to determine whether the improvements can be safely occupied in the future and whether rebuilding should be allowed. If rebuilding is not allowed, the permit shall terminate.

F. DAMAGE TO UNITED STATES PROPERTY. The holder has an affirmative duty to protect from damage the land, property, and other interests of the United States. Damage includes but is not limited to fire suppression costs and damage to government-owned improvements covered by this permit.

1. The holder shall be liable for all injury, loss, or damage, including fire suppression, prevention and control of the spread of invasive species, or other costs in connection with rehabilitation or restoration of natural resources resulting from the use or occupancy authorized by this permit. Compensation shall include but not be limited to the value of resources damaged or destroyed, the costs of restoration, cleanup, or other mitigation, fire suppression or other types of abatement costs, and all administrative, legal (including attorney's fees), and other costs. Such costs may be deducted from a performance bond required under clause IV.J.

2. The holder shall be liable for damage caused by use of the holder or the holder's heirs, assigns, agents, employees, contractors, or lessees to all roads and trails of the United States to the same extent as provided under clause IV.F.1, except that liability shall not include reasonable and ordinary wear and tear.

G. HEALTH AND SAFETY. The holder shall take all measures necessary to protect the health and safety of all persons affected by the use and occupancy authorized by this permit. The holder shall promptly abate as completely as possible and in compliance with all applicable laws and regulations any physical or mechanical procedure, activity, event, or condition existing or occurring in connection with the authorized use and occupancy during the term of this permit that causes or threatens to cause a hazard to the health or safety of the public or the holder's employees or agents. The holder shall as soon as practicable notify the authorized officer of all serious accidents that occur in connection with these procedures, activities, events, or conditions. The Forest Service has no duty under the terms of this permit to inspect the permit area or operations of the holder for hazardous conditions or compliance with health and safety standards.

H. ENVIRONMENTAL PROTECTION.

1. For purposes of clause IV.H and section V, "hazardous material" shall mean (a) any hazardous substance under section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601(14); (b) any pollutant or contaminant under section 101(33) of CERCLA, 42 U.S.C. 9601(33); (c) any petroleum product or its derivative, including fuel oil, and waste oils; and (d) any hazardous substance, extremely hazardous substance, toxic substance, hazardous waste, ignitable, reactive or corrosive materials, pollutant, contaminant, element, compound, mixture, solution or substance that may pose a present or potential hazard to human health or the environment under any applicable environmental laws.

2. The holder shall avoid damaging or contaminating the environment, including but not limited to the soil, vegetation (such as trees, shrubs, and grass), surface water, and groundwater, during the holder's use and occupancy of the permit area. Environmental damage includes but is not limited to all costs and damages associated with or resulting from the release or threatened release of a hazardous material occurring during or as a result of activities of the holder or the holder's heirs, assigns, agents, employees, contractors, or lessees on, or related to, the lands, property, and other interests covered by this permit. If the environment or any government property covered by this permit becomes damaged in connection with the holder's use and occupancy, the holder shall as soon as practicable repair the damage or replace the damaged items to the satisfaction of the authorized officer and at no expense to the United States.

3. The holder shall as soon as practicable, as completely as possible, and in compliance with all applicable laws and regulations abate any physical or mechanical procedure, activity, event, or condition existing or occurring in connection with the authorized use and occupancy during or after the term of this permit that causes or threatens to cause harm to the environment, including areas of vegetation or timber, fish or other wildlife populations, their habitats, or any other natural resources.

I. INDEMNIFICATION OF THE UNITED STATES. The holder shall indemnify, defend, and hold harmless the United States for any costs, damages, claims, liabilities, and judgments arising from past, present, and future acts or omissions of the holder in connection with the use or occupancy authorized by this permit. This indemnification provision includes but is not limited to acts and omissions of the holder or the holder's heirs, assigns, agents, employees, contractors, or lessees in connection with the use or occupancy authorized by this permit which result in (1) violations of any laws and regulations which are now or which may in the future become applicable; (2) judgments, claims, demands, penalties, or fees assessed against the United States; (3) costs, expenses, and damages incurred by the United States; or (4) the release or threatened release of any solid waste, hazardous waste, hazardous materials, pollutant, contaminant, oil in any form, or petroleum product into the environment. The authorized officer may prescribe terms that allow the holder to replace, repair, restore, or otherwise undertake necessary curative actions to mitigate damages in addition to or as an alternative to monetary indemnification.

J. BONDING. The authorized officer may require the holder to furnish a surety bond or other security for any of the obligations imposed by the terms and conditions of this permit or any applicable law, regulation, or order.

K. STRICT LIABILITY. The holder shall be strictly liable (liable without proof of negligence) to the United States for \$amount up to \$1 million per occurrence for any injury, loss, or damage arising in tort under this permit. Liability in tort for injury, loss, or damage to the United States exceeding the prescribed amount of strict liability in tort shall be determined under the law of negligence.

V. RESOURCE PROTECTION

A. COMPLIANCE WITH ENVIRONMENTAL LAWS. The holder shall in connection with the use or occupancy authorized by this permit comply with all applicable federal, state, and local environmental laws and regulations, including but not limited to those established pursuant to the Resource Conservation and Recovery Act, as amended, 42 U.S.C. 6901 et seq., the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq., the Oil Pollution Act, as amended, 33 U.S.C. 2701 et seq., the Clean Air Act, as amended, 42 U.S.C. 7401 et seq., CERCLA, as amended, 42 U.S.C. 9601 et seq., the Toxic Substances Control Act, as amended, 15 U.S.C. 2601 et seq., the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, 7 U.S.C. 136 et seq., and the Safe Drinking Water Act, as amended, 42 U.S.C. 300f et seq.

B. VANDALISM. The holder shall take reasonable measures to prevent and discourage vandalism and disorderly conduct and when necessary shall contact the appropriate law enforcement officer.

C. PESTICIDE USE.

1. **Authorized Officer Concurrence.** Pesticides may not be used outside of buildings in the permit area to control pests, including undesirable woody and herbaceous vegetation (including aquatic plants), insects, birds, rodents, or fish without prior written concurrence of the authorized officer. Only those products registered or otherwise authorized by the U.S. Environmental Protection Agency and appropriate State authority for the specific purpose planned shall be authorized for use within areas on National Forest System lands.

2. **Pesticide-Use Proposal.** Requests for concurrence of any planned uses of pesticides shall be provided in advance using the Pesticide-Use Proposal (form FS-2100-2). Annually the holder shall, on the due date established by the authorized officer, submit requests for any new, or continued, pesticide usage. The Pesticide-Use Proposal shall cover a 12-month period of planned use. The Pesticide-Use Proposal shall be submitted at least 60 days in advance of pesticide application. Information essential for review shall be provided in the form specified. Exceptions to this schedule may be allowed, subject to emergency request and approval, only when unexpected outbreaks of pests require control measures which were not anticipated at the time a Pesticide-Use Proposal was submitted.

3. **Labeling, Laws, and Regulations.** Label instructions and all applicable laws and regulations shall be strictly followed in the application of pesticides and disposal of excess materials and containers. No pesticide waste, excess materials, or containers shall be disposed of in any area administered by the Forest Service.

D. ARCHAEOLOGICAL-PALEONTOLOGICAL DISCOVERIES. The holder shall immediately notify the authorized officer of all antiquities or other objects of historic or scientific interest, including but not limited to historic or prehistoric ruins, fossils, or artifacts discovered in connection with the use and occupancy authorized by this permit. The holder shall follow the applicable inadvertent discovery protocols for the undertaking provided in an agreement executed pursuant to section 106 of the National Historic Preservation Act, 54 U.S.C. 306108; if there are no such agreed-upon protocols, the holder shall leave these discoveries intact and in place until consultation has occurred, as informed, if applicable, by any programmatic agreement with tribes. Protective and mitigation measures developed under this clause shall be the responsibility of the holder. However, the holder shall give the authorized officer written notice before implementing these measures and shall coordinate with the authorized officer for proximate and contextual discoveries extending beyond the permit area.

E. NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT (NAGPRA). In accordance with 25 U.S.C.

3002(d) and 43 CFR 10.4, if the holder inadvertently discovers human remains, funerary objects, sacred objects, or objects of cultural patrimony on National Forest System lands, the holder shall immediately cease work in the area of the discovery and shall make a reasonable effort to protect and secure the items. The holder shall follow the applicable NAGPRA protocols for the undertaking provided in the NAGPRA plan of action or the NAGPRA comprehensive agreement; if there are no such agreed-upon protocols, the holder shall as soon as practicable notify the authorized officer of the discovery and shall follow up with written confirmation of the discovery. The activity that resulted in the inadvertent discovery may not resume until 30 days after the forest archaeologist certifies receipt of the written confirmation, if resumption of the activity is otherwise lawful, or at any time if a binding written agreement has been executed between the Forest Service and the affiliated Indian tribes that adopts a recovery plan for the human remains and objects.

F. PROTECTION OF THREATENED AND ENDANGERED SPECIES, SENSITIVE SPECIES, AND SPECIES OF CONSERVATION CONCERN AND THEIR HABITAT.

1. **Threatened and Endangered Species and Their Habitat.** The location of sites within the permit area needing special measures for protection of plants or animals listed as threatened or endangered under the Endangered Species Act (ESA) of 1973, 16 U.S.C. 1531 et seq., as amended, or within designated critical habitat shall be shown on a map in an appendix to this permit and may be shown on the ground. The holder shall take any protective and mitigation measures specified by the authorized officer as necessary and appropriate to avoid or reduce effects on listed species or designated critical habitat affected by the authorized use and occupancy. Discovery by the holder or the Forest Service of other sites within the permit area containing threatened or endangered species or designated critical habitat not shown on the map in the appendix shall be promptly reported to the other party and shall be added to the map.

2. **Sensitive Species and Species of Conservation Concern and Their Habitat.** The location of sites within the permit area needing special measures for protection of plants or animals designated by the Regional Forester as sensitive species or as species of conservation concern pursuant to FSM 2670 shall be shown on a map in an appendix to this permit and may be shown on the ground. The holder shall take any protective and mitigation measures specified by the authorized officer as necessary and appropriate to avoid or reduce effects on sensitive species or species of conservation concern or their habitat affected by the authorized use and occupancy. Discovery by the holder or the Forest Service of other sites within the permit area containing sensitive species or species of conservation concern or their habitat not shown on the map in the appendix shall be promptly reported to the other party and shall be added to the map.

H. CONSENT TO STORE HAZARDOUS MATERIALS. The holder shall not store any hazardous materials at the site without prior written approval from the authorized officer. This approval shall not be unreasonably withheld. If the authorized officer provides approval, this permit shall include, or in the case of approval provided after this permit is issued, shall be amended to include specific terms addressing the storage of hazardous materials, including the specific type of materials to be stored, the volume, the type of storage, and a spill plan. Such terms shall be proposed by the holder and are subject to approval by the authorized officer.

I. CLEANUP AND REMEDIATION.

1. The holder shall immediately notify all appropriate response authorities, including the National Response Center and the authorized officer or the authorized officer's designated representative, of any oil discharge or of the release of a hazardous material in the permit area in an amount greater than or equal to its reportable quantity, in accordance with 33 CFR Part 153, Subpart B, and 40 CFR Part 302. For the purposes of this requirement, "oil" is as defined by section 311(a)(1) of the Clean Water Act, 33 U.S.C. 1321(a)(1). The holder shall immediately notify the authorized officer or the authorized officer's designated representative of any release or threatened release of any hazardous material in or near the permit area which may be harmful to public health or welfare or which may adversely affect natural resources on federal lands.

2. Except with respect to any federally permitted release as that term is defined under Section 101(10) of CERCLA, 42 U.S.C. 9601(10), the holder shall clean up or otherwise remediate any release, threat of release, or discharge of hazardous materials that occurs either in the permit area or in connection with the holder's activities in the permit area, regardless of whether those activities are authorized under this permit. The holder shall perform cleanup or remediation immediately upon discovery of the release, threat of release, or discharge of hazardous materials. The holder shall perform the cleanup or remediation to the satisfaction of the authorized officer and at no expense to the United States. Upon revocation or termination of this permit, the holder shall deliver the site to the Forest Service free and clear of contamination.

VI. LAND USE FEE AND DEBT COLLECTION

A. LAND USE FEES. The holder shall pay in advance an annual land use fee in accordance with the fee schedule for communications sites in Forest Service Handbook 2709.11, Chapter 90. The annual land use fee shall be adjusted annually using the Consumer Price Index-Urban (CPI-U).

B. MODIFICATION OF THE LAND USE FEE. The land use fee may be revised whenever necessary to reflect the market value of the authorized use or occupancy or when the fee system used to calculate the land use fee is modified or replaced.

C. FEE PAYMENT ISSUES.

1. Crediting of Payments. Payments shall be credited on the date received by the deposit facility, except that if a payment is received on a non-workday, the payment shall not be credited until the next workday.

2. Disputed Fees. Fees are due and payable by the due date. Disputed fees must be paid in full. Adjustments will be made if dictated by an administrative appeal decision, a court decision, or settlement terms.

3. Late Payments

(a) Interest. Pursuant to 31 U.S.C. 3717 et seq., interest shall be charged on any fee amount not paid within 30 days from the date it became due. The rate of interest assessed shall be the higher of the Prompt Payment Act rate or the rate of the current value of funds to the United States Treasury (i.e., the Treasury tax and loan account rate), as prescribed and published annually or quarterly by the Secretary of the Treasury in the Federal Register and the Treasury Fiscal Requirements Manual Bulletins. Interest on the principal shall accrue from the date the fee amount is due.

(b) Administrative Costs. If the account becomes delinquent, administrative costs to cover processing and handling the delinquency shall be assessed.

(c) Penalties. A penalty of 6% per annum shall be assessed on the total amount that is more than 90 days delinquent and shall accrue from the same date on which interest charges begin to accrue.

(d) Termination for Nonpayment. This permit shall terminate without the necessity of prior notice and opportunity to comply when any permit fee payment is 90 calendar days from the due date in arrears. The holder shall remain responsible for the delinquent fees.

4. Administrative Offset and Credit Reporting. Delinquent fees and other charges associated with the permit shall be subject to all rights and remedies afforded the United States pursuant to 31 U.S.C. 3711 et seq. and common law. Delinquencies are subject to any or all of the following:

(a) Administrative offset of payments due the holder from the Forest Service.

(b) If in excess of 60 days, referral to the United States Department of the Treasury for appropriate collection action as provided by 31 U.S.C. 3711(g)(1).

(c) Offset by the Secretary of the Treasury of any amount due the holder, as provided by 31 U.S.C. 3720 et seq.

(d) Disclosure to consumer or commercial credit reporting agencies.

VII. REVOCAION, SUSPENSION, AND TERMINATION

A. REVOCAION AND SUSPENSION. The authorized officer may revoke or suspend this permit in whole or in part:

1. For noncompliance with federal, state, or local law.
2. For noncompliance with the terms of this permit.
3. For abandonment or other failure of the holder to exercise the privileges granted.
4. With the consent of the holder.
5. For specific and compelling reasons in the public interest.

Prior to revocation or suspension, other than immediate suspension under clause VII.B, the authorized officer shall give the holder written notice of the grounds for revocation or suspension and a reasonable period, typically not to exceed 90 days, to cure any noncompliance.

B. IMMEDIATE SUSPENSION. The authorized officer may immediately suspend this permit in whole or in part when necessary to protect public health or safety or the environment. The suspension decision shall be in writing. The holder may request an on-site review with the authorized officer's supervisor of the adverse conditions prompting the suspension. The authorized officer's supervisor shall grant this request within 48 hours. Following the on-site review, the authorized

officer's supervisor shall promptly affirm, modify, or cancel the suspension.

C. APPEALS AND REMEDIES. Written decisions by the authorized officer relating to administration of this permit are subject to administrative appeal pursuant to 36 CFR Part 214, as amended. Revocation or suspension of this permit shall not give rise to any claim for damages by the holder against the Forest Service.

D. TERMINATION. This permit shall terminate when by its terms a fixed or agreed upon condition, event, or time occurs without any action by the authorized officer. Examples include but are not limited to expiration of the permit by its terms on a specified date and termination upon change of control of the business entity. Termination of this permit shall not require notice, a decision document, or any environmental analysis or other documentation. Termination of this permit is not subject to administrative appeal and shall not give rise to any claim for damages by the holder against the Forest Service.

E. RIGHTS AND RESPONSIBILITIES UPON REVOCATION OR TERMINATION WITHOUT ISSUANCE OF A NEW PERMIT. Upon revocation or termination of this permit without issuance of a new permit, the holder shall remove all structures and improvements, except those owned by the United States, within a reasonable period prescribed by the authorized officer and shall restore the site to the satisfaction of the authorized officer. If the holder fails to remove all structures and improvements within the prescribed period, they shall become the property of the United States and may be sold, destroyed, or otherwise disposed of without any liability to the United States. However, the holder shall remain liable for all costs associated with their removal, including costs of sale and impoundment, cleanup, and restoration of the site.

VIII. MISCELLANEOUS PROVISIONS

A. MEMBERS OF CONGRESS. No member of or delegate to Congress or resident commissioner shall benefit from this permit either directly or indirectly, except to the extent the authorized use provides a general benefit to a corporation.

B. CURRENT ADDRESSES. The holder and the Forest Service shall keep each other informed of current mailing addresses, including those necessary for billing and payment of land use fees.

C. SUPERSEDED PERMIT. This permit supersedes a special use permit designated PROVO CITY CORPORATION, PLG102002A, dated 12/04/2002.

D. SUPERIOR CLAUSES. If there is a conflict between any of the preceding printed clauses and any of the following clauses, the preceding printed clauses shall control.

E. MINOR WATER USES (D-27).

This permit does not confer any water rights on the holder. Water rights are not required by State law and may not be acquired to exercise the minor water uses authorized by this permit.

F. IMPROVEMENT RELOCATION (X-33).

This authorization is granted with the express understanding that should future location of United States Government-owned improvements or road rights-of-way require the relocation of the holder's improvements, such relocation will be done by, and at the expense of, the holder within a reasonable time as specified by the Authorized Officer. **THIS PERMIT IS ACCEPTED SUBJECT TO ALL ITS TERMS AND CONDITIONS.**

BEFORE ANY PERMIT IS ISSUED TO AN ENTITY, DOCUMENTATION MUST BE PROVIDED TO THE AUTHORIZED OFFICER OF THE AUTHORITY OF THE SIGNATORY FOR THE ENTITY TO BIND IT TO THE TERMS AND CONDITIONS OF THE PERMIT.

ACCEPTED:

RYAN YORK
WATER SOURCES MANAGER
PROVO CITY WATER

R-York 3-4-2020

HOLDER NAME, PRECEDED BY NAME AND TITLE
OF PERSON SIGNING ON BEHALF OF HOLDER,
IF HOLDER IS AN ENTITY

SIGNATURE

DATE

APPROVED:

DAVID C WHITTEKIEND
FOREST SUPERVISOR

David C. Whittekiend 3/10/2020

NAME AND TITLE OF AUTHORIZED OFFICER

SIGNATURE

DATE

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0082. The time required to complete this information collection is estimated to average one hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and, where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call toll free (866) 632-9992 (voice). TDD users can contact USDA through local relay or the Federal relay at (800) 877-8339 (TDD) or (866) 377-8642 (relay voice). USDA is an equal opportunity provider and employer.

The Privacy Act of 1974 (5 U.S.C. 552a) and the Freedom of Information Act (5 U.S.C. 552) govern the confidentiality to be provided for information received by the Forest Service.



SPENCER J. COX
Governor

DEIDRE M. HENDERSON
Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES

JOEL FERRY
Executive Director

Division of Water Rights

TERESA WILHELMSEN
State Engineer/Division Director

ORDER OF THE STATE ENGINEER

FOR STREAM ALTERATION APPLICATION NUMBER **23-55-05SA**
IN THE NAME OF PROVO CITY (SHANE JONES) FOR ALTERATION
TO ROCK CANYON CREEK IN UTAH COUNTY, UTAH

Stream Alteration Application No. **23-55-05SA**, submitted in the name of Provo City (Shane Jones), applicant, in order to install a 24-inch discharge pipeline and rock riprap channel lining associated with Rock Canyon Creek, a natural stream located in Utah County, Utah, is hereby **APPROVED**, contingent upon the conditions outlined in this **ORDER**. This approval also constitutes compliance with Section 404 (e) of the Clean Water Act (33 USC 1344) pursuant to Programmatic General Permit 10 issued to the State of Utah by the U.S. Army Corps of Engineers on February 22, 2021, and is subject to all conditions therein. Full text of Programmatic General Permit 10 can be found at the following link:

http://www.waterrights.utah.gov/strmalt/whitepapers/20210222_PGP10.pdf. The applicant is hereby authorized to conduct the work detailed in the application and supporting documentation, as described in this **ORDER**. Any modification or addition to the work may require additional authorization and/or application resubmittal.

1. The expiration date of this **ORDER** is **May 3, 2025**. Work affecting the bed and/or banks of the stream may not be conducted after this date. Extension of the **ORDER** is subject to review by the Division. A request for extension must be submitted in writing to the Division and include an explanation for project delay.
2. A copy of this **ORDER** must be kept onsite at any time the work authorized under this order is in progress.
3. Best Management Practices should be implemented and maintained during any streamside or instream work to minimize sedimentation, temporary erosion of stream banks, and needless damage or alteration to the streambed.
4. Work must be accomplished during a period of low flow. Sediment introduced into stream flows during construction must be controlled to prevent increases in turbidity downstream. If necessary, flows must be diverted away from the construction area through use of a non-erodible cofferdam or other means of bypass.
5. Equipment should work from the top of the bank or from the channel to minimize disturbance to the riparian area and to protect the banks. Heavy equipment should avoid crossing and/or disturbing wetlands.



6. Impacts to the stream channel and surrounding environment must be minimized. Vegetation should not be destroyed, but if some disturbance is necessary, then revegetating with native species will be required, especially in the case of woody shrubs. The channel contours and configuration must not be changed except in the case of bank contouring for stabilization purposes.
7. Fill materials should be free of fines, waste, pollutants, and noxious weeds/seeds.
8. Equipment must be properly cleaned off-site prior to construction. If necessary during and/or after construction, fueling and cleaning of equipment must occur well away from any stream channels.
9. Excavated material and construction debris may not be wasted in any stream channel or placed in flowing waters, this will include material such as grease, oil, joint coating, or any other possible pollutant. Excess materials must be wasted at an upland site well away from any channel. Construction materials, bedding material, excavated material, etc. may not be stockpiled in riparian or channel areas.
10. Within 30 days after the completion of this project, the attached compliance certification form must be completed and returned to the U.S. Army Corps of Engineers. Failure to return this compliance certification form would invalidate U.S. Army Corps of Engineers Programmatic General Permit 10, thereby placing the applicant in violation of Section 404 of the Clean Water Act. Form can be found at:
<https://www.waterrights.utah.gov/strmalt/ComplianceCertification.pdf>

The statutory process and criteria for evaluation of this application are described at Utah Code Ann. § 73-3-29 and Administrative Rule R655-13. The State Engineer has determined that this application does meet the necessary legal criteria for approval based upon the following Findings of Fact and reasoning set forth in the Discussion.

FINDINGS OF FACT

1. The application was received by the Division of Water Rights (“Division”) on March 9, 2023, and made available for comment on the Division’s webpage, provided to pertinent governmental agencies, and to other entities as warranted, for a period of 20 calendar days, said period concluding prior to March 29, 2023.
2. The application contains the following information:
 - The stated description of the proposed project is: To install a 24-inch discharge pipeline and rock riprap channel lining associated with Rock Canyon Creek in Utah County.
 - The stated purpose of the proposed project is: To facilitate an aquifer storage recharge project.

3. The following comments or objections on the proposed project were received from:
- Hollis Jencks – U.S. Army Corps of Engineers
 - Tracie Harrison – Utah Division of Emergency Management

The comments or objections received are summarized as follows:

- The U.S. Army Corps of Engineers has reviewed the application and determined that the proposed project meets the terms and conditions of Programmatic General Permit 10.
- Applicant will need to verify if they will be required to get a floodplain development permit from the local Floodplain Administrator (FPA) in the community they are doing the work in. The applicant needs to make sure they are in compliance with the National Flood Insurance Program (NFIP) and the local floodplain regulations by contacting the community FPA. Even state and federal agencies need to obtain the local floodplain development permits as per the federal regulations 44CFR 60.3. This may include obtaining a Letter of Map Change (LOMC) from FEMA as well as any other federal or local permits required to develop in Special Flood Hazard Areas (SFHA). The community FPA should know what is required in these areas. If there is a question as to what is needed, individuals can call or e-mail my office (385-499-2077, tjharrison@utah.gov).

DISCUSSION

1. Based on a review of the Division's water rights records and/or a review of the application by personnel of the Division's regional office, it is the opinion of the State Engineer that the project will not impair vested water rights.
2. It is the opinion of the State Engineer that the project will not unreasonably or unnecessarily affect recreational use or the natural stream environment.
3. It is the opinion of the State Engineer that the project will not unreasonably or unnecessarily endanger aquatic wildlife.
4. It is the opinion of the State Engineer that the project will not unreasonably or unnecessarily diminish the natural channel's ability to conduct high flows.
5. Other comments or concerns submitted by interested persons or parties are not believed to be within the purview of the State Engineer in evaluating an Application to Alter a Natural Stream.

Documents associated with this **ORDER** and the submitted application are included in the stream alteration file and available for viewing on the Division of Water Rights website.

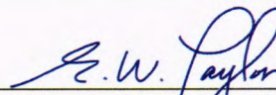
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May 3, 2023

This **ORDER** does not authorize trespass, easements, rights-of-way, or any other access and land use permits. It is the responsibility of the applicant to obtain any such authorizations as may be necessary for this proposal. It is recommended that the applicant coordinate with potentially impacted landowners prior to initiating stream alteration activities.

This **ORDER** is subject to the provisions of UTAH ADMIN. CODE R. 655-6-17 of the Division of Water Rights and to UTAH CODE ANN. §§ 63G-4-302 and 73-3-14, which provide for persons or parties with legal standing to file either a Request for Reconsideration with the State Engineer or an appeal with the appropriate District Court. A Request for Reconsideration must be filed with the State Engineer within 20 days of the date of this **ORDER**. However, a Request for Reconsideration is not a prerequisite to filing a court appeal. A court appeal must be filed within 30 days after the date of this **ORDER**, or if a Request for Reconsideration has been filed, within 30 days after the date the Request for Reconsideration is denied. A Request for Reconsideration is considered denied when no action is taken within 20 days after the Request is filed.

Your contact with the Division is Chuck Williamson, who can be reached at telephone number 801-538-7404.

Dated this 3rd day of May, 2023.



Everett W. Taylor, P.E.
Assistant State Engineer

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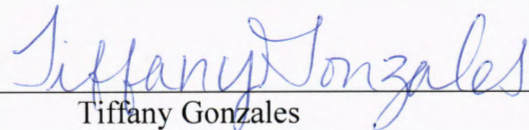
Enclosure

Mailed a copy of the foregoing Order this 3rd day of May, 2023, to:

PROVO CITY
SHANE JONES
1377 SOUTH 350 EAST
PROVO, UT 84606

Hollis Jencks - U.S. Army Corps of Engineers, hollis.g.jencks@usace.army.mil
Chase McDonald - Regional Engineer, chasemedonald@utah.gov
Nolan Hahn - EPA, Hahn.Nolan@epa.gov
Mark Farmer - Division of Wildlife Resources, markfarmer@utah.gov
Tracie J. Harrison - Division of Emergency Management, tjharrison@utah.gov
Bryan Pitterle - Barr Engineering, bpitterle@barr.com
Shane Jones, shanej@provo.utah.gov

By:



Tiffany Gonzales
Executive Secretary

BABAA Best Practices

Documenting Compliance with Build America, Buy America Act (BABAA) Requirements

Procurement Disaster Assistance Team
(PDAT) January 2023



FEMA

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Background

Overview of FEMA BABAA Requirements

The Infrastructure Investment and Jobs Act (IIJA), signed into law in November 2021, includes the Build America, Buy America Act (BABAA), which applies a new purchasing preference for American-made products. In accordance with BABAA, FEMA must ensure that no federal financial assistance for “infrastructure” projects are awarded “unless all the iron, steel, manufactured products and construction materials used in the project are produced in the United States,” by May 14, 2022.¹

In November 2022, FEMA issued, [FEMA Interim Policy #207-22-0001: Buy America Preference in FEMA Financial Assistance Programs for Infrastructure](#) (“interim guidance”), to implement the BABAA requirements for the [23 FEMA financial assistance programs subject to BABAA](#). The interim guidance includes requirements related to both material purchases and contract language. To comply with these requirements, FEMA award recipients and subrecipients must include a required contract provision and contractor self-certification of compliance with BABAA in subject contract documents. FEMA also recommends recipients and subrecipients further document compliance with BABAA by requesting a BABAA certification letter from the manufacturer. The interim guidance also provides information on waivers, including FEMA’s waiver authority and waiver request process.

The purpose of this document is to provide some best practices for FEMA award recipients and subrecipients on how to document compliance with key BABAA requirements.

Not all FEMA financial assistance programs are subject to BABAA. Most disaster financial assistance programs are not subject to the requirements, including the Public Assistance Grant Program, Hazard Mitigation Grant Program, Individuals and Households Program, and Fire Mitigation Grant Program. A full list of programs and whether they are subject to BABAA can be found at [Programs and Definitions: Build America, Buy America Act | FEMA.gov](#).

¹ Although BABAA requirements went into effect on May 14, 2022, FEMA determined that it was in the public interest to issue a general applicability waiver of the BABAA requirements to allow for an adjustment period in order for FEMA, its recipients/subrecipients, industry partners, and other stakeholders to develop and transition to the new compliance and certification process for iron, steel, manufactured products, and construction materials. **This waiver was effective from July 1, 2022 through January 1, 2023.** The domestic preference requirements will not apply to awards or funding obligated during this waiver period and will only apply to awards or funding obligated on or after Jan. 2, 2023.

BABAA Domestic Preference Requirements

BABAA requires that FEMA award recipients and subrecipients subject to BABAA comply with the following domestic preference requirements in their infrastructure projects:

1. All iron and steel items used in the project must be produced in the United States. This means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.
2. All manufactured products used in projects must be produced in the United States. For a manufactured product to be considered produced in the United States, the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States must be greater than 55% of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation.
3. All construction materials used in projects must be manufactured in the United States. This means all manufacturing processes for the construction material occurred in the United States.

BABAA Contract Level Compliance

Pursuant to [*FEMA Interim Policy #207-22-0001: Buy America Preference in FEMA Financial Assistance Programs for Infrastructure*](#), all recipient and subrecipient contracts under FEMA financial assistance awards for infrastructure, issued on or after Jan. 2, 2023, must include a contract provision explaining the BABAA requirements and a self-certification where contractors can certify compliance with domestic preference requirements outlined in BABAA, unless FEMA waives the BABAA requirement.

SUGGESTED LANGUAGE

The following provides suggested language for the contract provision:

Contractors and their subcontractors who apply or bid for an award for an infrastructure project subject to the domestic preference requirement in the Build America, Buy America Act (BABAA) shall file the required certification to the non-federal entity with each bid or offer for an infrastructure project, unless a domestic preference requirement is waived by FEMA. Contractors and subcontractors certify that no federal financial assistance funding for infrastructure projects will be provided unless all the iron, steel, manufactured projects, and construction materials used in the project are produced in the United States. BABAA, Pub. L. No. 117-58, §§ 70901-52. Contractors and subcontractors shall also disclose any use of federal financial assistance for infrastructure projects that do not ensure compliance with BABAA domestic preference requirement. Such disclosures shall be forwarded to the grant recipient who in turn will forward the disclosures to FEMA, the federal awarding agency;

subrecipients will forward disclosures to the pass-through entity, who will in turn forward the disclosures to FEMA.

For FEMA financial assistance programs subject to BABAA, contractors and subcontractors must sign and submit the following certification to the next tier (e.g., subcontractors submit to the contractor; contractors submit to the non-federal entity).

SUGGESTED LANGUAGE

The following provides suggested language for the self-certification:

The undersigned certifies, to the best of their knowledge and belief, that:

The Build America, Buy America Act (BABAA) requires that no federal financial assistance for “infrastructure” projects is provided “unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States.” Section 70914 of Public Law No. 117-58, §§ 70901-52.

The undersigned certifies that for the _____ (**Project Name and Location**) _____ the iron, steel, manufactured products, and construction materials used in this contract are in full compliance with the BABAA requirements including:

1. All iron and steel used in the project are produced in the United States. This means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.
2. All manufactured products purchased with FEMA financial assistance must be produced in the United States. For a manufactured product to be considered produced in the United States, the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55% of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation.
3. All construction materials are manufactured in the United States. This means that all manufacturing processes for the construction material occurred in the United States.

“The, _____ [**Contractor or Subcontractor**] _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the [**Contractor or Subcontractor**] understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.”

Signature of [**Contractor’s or Subcontractor’s**] Authorized Official

Name and Title of [**Contractor’s or Subcontractor’s**] Authorized Official

Date

Manufacturer Certifications

As an additional step to ensure compliance when purchasing products for the project, FEMA award recipients or subrecipients may request a certification letter from the product manufacturer to demonstrate compliance with BABAA requirements. Although requesting manufacturer certifications is not required, FEMA recommends this step as a best practice for documenting compliance with BABAA. FEMA recommends that certification letters contain five essential elements, which include:

- A reference to the project;
- Specific product information;
- Compliance with BABAA reference;
- Location of manufacturer (country); and
- A company representative signature.

The certification letter should be maintained as part of the project record to be made available to FEMA if requested. Below are examples of the types of manufacturer certifications.

Step Certification

A step certification is a type of certification process under which each handler (supplier, fabricator, manufacturer, processor, etc.) of the subject products and materials certifies that their step in the process was domestically performed. Each time a step in the manufacturing process takes place, the manufacturer delivers its work along with a certification of its origin. Step certification creates a paper trail which documents the location of the manufacturing process involved with the production of subject products and materials. Sample step certification language is included below.

SAMPLE STEP CERTIFICATION LETTER:

Company letterhead.

Date

Company Name

Company Address

City, State Zip

Subject: Build America, Buy America Act Step Certification for Project (XXXXXXXXXX)

I, (company representative), certify the (**melting, bending, coating, galvanizing, cutting, etc.**) process for (**manufacturing or fabricating**) the following products and/or materials shipped or provided for the subject project is in full compliance with the Build America, Buy America Act

(BABAA) requirement as mandated in the Infrastructure Investment and Jobs Act (IIJA) Pub. L. No. 117-58, §§ 70901-52.

Item, Products and/or Materials:

1. XXXX
2. XXXX
3. XXXX

Such process took place at the following location: _____.

If any of the above compliance statements change while providing material to this project, we will immediately notify the prime contractor and the engineer.

Signed by company representative

Final Certification Letter

Although obtaining step certification is a best practice, if not possible, FEMA award recipients and subrecipients may consider requesting a final manufacturer certification letter. For a final certification letter, the final manufacturer that delivers the product to the worksite, vendor, or contractor provides a certification asserting that all manufacturing processes occurred in the United States. While this type of certification may be acceptable, it may not provide the same degree of assurance, and therefore additional documentation may be needed if the certification is lacking important information. Sample final certification language is included below.

SAMPLE FINAL CERTIFICATION LETTER

Company letterhead.

Date

Company Name

Company Address

City, State Zip

Subject: Build America, Buy America Act Certification for Project (XXXXXXXXXX)

I, (**company representative**), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the Build America, Buy America Act (BABAA) requirement as mandated in the Infrastructure Investment and Jobs Act (IIJA) Pub. L. No. 117-58, §§ 70901-52.

Item, Products and/or Materials:

1. XXXX
2. XXXX
3. XXXX

Such process took place at the following location: _____.

If any of the above compliance statements change while providing material to this project, we will immediately notify the prime contractor and the engineer.

Signed by company representative

FEMA BABAA Waivers

Waivers

FEMA has the authority to waive the BABAA requirement when: (1) applying the requirement is inconsistent with the public interest (a “public interest waiver”); (2) types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality (a “nonavailability waiver”); or (3) inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25% (an “unreasonable cost waiver”).

If a project cannot comply with the BABAA requirements, recipients and subrecipients must seek a waiver from FEMA. There are two categories of waivers: General Applicability Waivers and Project-Specific Waivers.

General Applicability Waivers

The term “general applicability waiver” refers to a waiver that applies generally across multiple awards. A general applicability waiver can be “product-specific” (e.g., applies only to a product or category of products) or “non-product specific” (e.g., applies to all “manufactured products”). Award recipients subject to BABAA may use general applicability waivers and do not require a separate application or approval by FEMA prior to use. These may cover categories of products known to be unavailable domestically or are intended to ease the burden of compliance.

For example, FEMA has issued one general applicability waiver to date, the [FEMA General Applicability Public Interest Waiver](#). Although the BABAA requirements went into effect on May 14, 2022, FEMA determined that it was in the public interest to issue a general applicability waiver of the BABAA requirements to allow for an adjustment period for FEMA, its recipients/subrecipients, industry partners, and other stakeholders to develop and transition to the new compliance and certification process for iron, steel, manufactured products, and construction materials. This waiver is effective from July 1, 2022, until Jan. 1, 2023. The domestic preference requirements will not attach to awards or funding obligated during this waiver period and will only attach to awards or funding obligated on or after Jan. 2, 2023.

FEMA anticipates issuing additional general applicability waivers related to *de minimis*, minor components, adjustment period for tribes, and small projects. As FEMA proposes and issues these waivers, they will be available for review on the [FEMA BABAA website](#).

Project-Specific Waivers

Project-specific waivers are for the use of a specified non-domestic product for a single project. An assistance recipient may request a waiver from FEMA through their FEMA grant representative. FEMA must approve waiver requests before a FEMA funded project can permanently incorporate a non-domestic product. Due to waiver requests being both project- and product-specific, any other assistance recipient who wishes to use a waiver for a similar product must apply for a separate waiver based on specific project circumstances.

Waiver Submission

The steps below outline the process for submitting a project-specific waiver request application. For the additional information on the Interim Waiver Review Process, please see [FEMA Interim Policy #207-22-0001: Buy America Preference in FEMA Financial Assistance Programs for Infrastructure](#). FEMA estimates that the timeline for most waiver requests will be 45-calendar days from date of submission until final waiver determination is made.

Step 1	Develop written waiver request. Request must include detailed justification for product use, product specifications, and a description of the effort to find an equivalent domestic product. Refer to “Waiver Requests” for additional guidance and requirements.
Step 2	Submit waiver request to FEMA grant representative.
Step 3	FEMA will perform a technical review of the waiver request. The waiver applicant should be prepared to provide additional information during FEMA’s technical review and respond to any such requests as soon as possible (and no later than 15 calendar days) after FEMA requests the information.

After FEMA completes the technical waiver review, the agency posts the waiver application for either a 15-calendar day or 30-calendar day (for general applicability waivers) public comment period after which a final determination will be made by the Office of Management and Budget (OMB) Made in America Office (MIAO). FEMA will inform the applicant of the final determination and the FEMA website will be updated with the determination status.

Waiver Requests

FEMA will use the following checklist to ensure applicant submissions for a waiver request meet BABAA requirements. We recommend recipients and subrecipients utilize this checklist to ensure timely review of their waiver request.

The checklists below outline the elements that should be included in the waiver requests, including:

1. Applicant or recipient information;
2. Infrastructure project information;
3. Project Materials, Technical Specifications, and Quantity;

4. Waiver Type; and
5. Federal Agency Information (this is to be completed by the federal agency)

Applicant or Recipient Contact Information

Ensure the following information is included within the application. All information provided should be at the recipient or subrecipient level where the product is to be installed:

- Legal Name
- Unique Entity Identifier (UEI)
- Street Address
- City
- County/Parish
- State
- Zip/Postal Code
- Submitter First and Last Name, Title, Email and Phone Number

Infrastructure Project Information

Ensure the following is completed within the application:

- Infrastructure project description and location
- Total Funding, including federal and non-federal costs
- Total estimated infrastructure costs, including all federal and non-federal shares (to the extent known)
- Identification if the waiver is for a specific product or a category of products

Project Materials, Technical Specifications, and Quantity

Ensure the following is completed within the application:

- List of iron or steel item(s), manufactured products, and constructions material(s) proposed to be excepted from BABAA requirements, including:
 - Name
 - Cost

- Country(ies) of origin (if known)
- Relevant Product Service Code (PSC) and North American Industry Classification System (NAICS) code for each
- Technical specifications description of item(s) to be waived. Waiver request cannot proceed without specifications. Examples of descriptions include:
 - PDF of plans and specifications (with individual product page highlighted)
 - Email defining products
 - Product cut sheet from manufacturer
 - Other
- Product quantity required
- Date required for product delivery

Waiver Type

Ensure the project-specific waiver type and information inputs for the waiver type is completed within the application:

- Nonavailability**
 - A description of the due diligence performed by the applicant, engineer/architect, or contractor, including names, and contact information of the manufacturers, distributors, or suppliers contacted for quotes (minimum 3) and the responses provided.
 - If one or more respondent indicated that they could provide a BABAA compliant item, but you are requesting the non-availability waiver because the lead time to obtain the BABAA compliant item is excessive, indicate how the difference in lead time between a BABAA compliant and non-compliant item is going to cause the project to miss a significant milestone or deadline.
- Unreasonable Cost** (BABAA compliance increases total project cost by more than 25%)
 - What is the additional cost of the BABAA compliant items, compared to using iron and steel, manufactured products, and construction materials of non-domestic or unknown origin? (File attachment of prices for BABAA compliant and non-compliant items for items to be included in the cost comparison.)
 - What is the additional administrative cost for compliance with the BABAA requirements? (File attachment of certification from the engineer or architect attesting to the actual or expected additional administrative cost.)

- For which items does the applicant request to be waived from the BABAA requirements to reduce costs below the 25% cost threshold?
- Public Interest**
 - Explanation of how waiving the BABAA requirement for this project or product serves the public interest
 - Additional information for the Agency to consider for the requested waiver
 - Anticipated impact if no waiver is issued
 - Certifying Official Name
 - Certifying Official Signature
 - Date of Certification

Federal Agency Information

Ensure the following is completed by the federal agency within the application:

- Federal Awarding Agency
- Financial assistance listing name and assistance listing number
- Federal financial assistance program title
- Federal awarding agency point of contact:
 - First Name
 - Last Name
 - Email
 - Phone
- Federal Award Identification Number (FAIN) (if available). Federal awarding agency organization information (e.g., Common Government wide Accounting Classification [CGAC] Agency Code). Enter the federal agency name, and subcomponent name, if known, and CGAC code.
- Indication of waiver level (Project, Award, Program, or Agency)
- Indication if waiver is a general applicability waiver or project-specific

- Agency summary and determination regarding the waiver request
- Attachment of additional files if space is needed to answer any of the questions in the form.
- Agency waiver, in an attempt to avoid the need for a project-specific waiver. Such a justification may cite, if applicable, the absence of any BABAA compliant bids received in response to a solicitation. This response should be a narrative and include all necessary information to support the justification for a waiver.

Additional Information

Additional information, including definitions, can be found at ["Buy America" Preference in FEMA Financial Assistance Programs for Infrastructure | FEMA.gov](#) and [Build America, Buy America Act Frequently Asked Questions \(FAQs\) | FEMA.gov](#). You can also refer to the Office of Management and Budget's Made in America Office Website ([Home | Made in America](#)) and the [Build America, Buy America Factsheet and FAQs for Award Recipients \(whitehouse.gov\)](#).

SECTION 01 40 00S

QUALITY REQUIREMENTS

Add this Supplemental Specification to the Contract Documents.

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes general quality control, including workmanship, manufacturer's instructions and certificates, and code compliance.

1.2 GENERAL

- A. Maintain quality control over Suppliers, manufacturers, products, services, Site conditions, and workmanship to produce Work of the specified quality.
- B. Maintain records of tests and results for reference by ENGINEER and OWNER at any time.
- C. Furnish copies of all test results and quality control procedures as part of Record Documents.
- D. Comply fully with manufacturer's instructions, including each step-in sequence.
- E. Should manufacturer's instructions conflict with Contract Documents, request clarification from ENGINEER before proceeding.
- F. Obtain copies of, and meet the requirements of, reference specifications. Should specified reference standards conflict with Contract Documents, request clarification from ENGINEER before proceeding.
- G. Comply with specified reference standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- H. Perform Work by persons qualified to produce workmanship of specified quality. Use persons licensed to perform Work where required by these Specifications or Laws and Regulations.
- I. Secure products and Work in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- J. Performance of tests or observations by ENGINEER or OWNER are for the sole benefit of ENGINEER and OWNER and are not intended to replace CONTRACTOR's quality control program. CONTRACTOR is solely responsible for establishing and

implementing a quality control program to ensure that the Work is in accordance with the Contract Documents.

- K. It is CONTRACTOR's responsibility to notify ENGINEER when CONTRACTOR believes Work (or intermediate stages or parts of Work) is of specified quality, and to permit ENGINEER to perform independent tests or analyses.
- L. The contractual relationship of the parties to the Agreement shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.3 FACTORY TESTS AND OBSERVATION

- A. Factory tests shall be conducted and test results, certificates and/or affidavits shall be submitted as required in the individual Specification Sections. Make submittals in accordance with the requirements of Specification Section 01 33 00S Submittal Procedures. Test results shall be submitted prior to the shipment of the tested equipment.
- B. Factory tests shall be conducted to establish the performance, capacity, rating, efficiency, or function of process, mechanical, electrical, or other equipment or materials.
- C. Factory tests shall be conducted in the factory or shop where the item is being fabricated. The test shall be set up and accomplished by the equipment manufacturer who shall provide all shop space, tools, equipment, instruments, personnel, and other facilities required for the satisfactory completion of each test.
- D. Factory tests may be witnessed by OWNER, or ENGINEER, or their representatives. Notify ENGINEER at least ten (10) working days in advance of testing to allow ENGINEER or OWNER opportunity to witness. Failure of CONTRACTOR to notify will be grounds for rejection of the test results, and CONTRACTOR may be required to repeat testing and/or replace affected Work.
- E. The cost of factory tests shall be incidental, and no additional compensation will be provided.

1.4 LABORATORY TESTS

- A. Laboratory tests shall be conducted, and test results, certificates, and/or affidavits shall be submitted, as required in the individual Specification Sections. Make submittals in accordance with the requirements of Specification Section 01 33 00S Submittal Procedures. Laboratory tests refer to those tests made by manufacturers, fabricators, Suppliers, or CONTRACTOR specifically for this Project and conducted by an independent testing laboratory.
- B. All laboratory tests shall be made by an independent testing laboratory approved by OWNER or ENGINEER. Those tests shall be performed in accordance with the specified procedures or in accordance with applicable ASTM procedures if no reference is included.

- C. Laboratory tests may be witnessed by OWNER, or ENGINEER, or their representatives. CONTRACTOR shall notify ENGINEER at least two (2) working days in advance of testing to allow ENGINEER opportunity to witness. Failure of CONTRACTOR to notify will be grounds for rejection of the test results and may require CONTRACTOR to repeat testing and/or replace affected Work.
- D. CONTRACTOR shall conduct routine testing of materials used in the Work to satisfy itself that the quality of the Work meets the requirements of the Contract Documents. OWNER or ENGINEER may also conduct routine sampling and analysis to ascertain the same. Where laboratory testing or material specifications or quality control requirements are specified in the individual Specification Sections, CONTRACTOR shall not proceed with phases of the Work until OWNER or ENGINEER have had opportunity to collect samples or conduct testing necessary to establish the specified quality of the Work. Such instances may include, but are not limited to, soil compaction control, soil gradation testing, moisture content testing, testing of finishes, testing for chlorine residual or other water quality parameters, testing of roofing samples, or any other specified tests.
- E. CONTRACTOR shall pay for all specified laboratory testing. OWNER will pay for testing OWNER desires other than that required by these Specifications. If testing by OWNER identifies defective Work, CONTRACTOR shall pay for all subsequent sample collection and testing costs performed by OWNER or ENGINEER that are required by ENGINEER or OWNER to convince OWNER that the defective Work has been repaired or replaced.

1.5 FIELD TESTS

- A. Conduct field tests and submit test results, certificates, and/or affidavits as required in the individual Specification Sections. Make submittals in accordance with the requirements of Specification Section 01 33 00S Submittal Procedures.
- B. Conduct field tests in accordance with the individual Specification Sections to establish the quality of complete systems or individual components of process, mechanical, and electrical equipment including, but not limited to, piping systems, electrical systems, control systems, ventilation systems, heating systems, water mains, sewers and drains, tanks and vessels, and similar facilities.
- C. Conduct field tests to establish the performance, capacity, function, efficiency, tightness, leakage, operating characteristics, or other special requirements. Conduct tests in accordance with specified procedures or standards. Use applicable standards or codes where none are specified.
- D. Field tests shall be set up and conducted by party responsible for performing the test. Provide all tools, equipment, instruments, personnel, and other facilities required for the satisfactory completion of each test, and observation of such tests by OWNER or ENGINEER.
- E. Field tests may be witnessed by OWNER, or ENGINEER, or their representatives. Notify ENGINEER at least four (4) working days in advance of testing to allow

OWNER or ENGINEER opportunity to witness. Failure of CONTRACTOR to notify will be grounds for rejection of test results and CONTRACTOR may be required to repeat testing and/or replace affected Work.

1.6 SURVEYING

- A. CONTRACTOR shall provide all surveying required to complete the Work as shown on the Plans and as specified. This generally relates to the drainage of pipes and finished concrete surfaces.
- B. OWNER will furnish benchmarks at or immediately adjacent to the Work as may reasonably be required by CONTRACTOR.

1.7 TESTING SCHEDULE

- A. The following table includes, but is not limited to, tests to be performed as part of this Project. Additional information regarding these tests can be found in the individual Specification Sections. Additional tests or inspections may be requested by OWNER.
- B. Coordinate all testing (whether paid for by OWNER or CONTRACTOR) with OWNER's Representative or ENGINEER/Architect.

Drawings / Specification Section	Specification Title	Test Description	Responsible for Performing	Responsible for Payment
03 30 05	Concrete Testing	Air/Slump/Temperature	Independent Testing Agency	CONTRACTOR
33 30 00	Sanitary Sewer Utilities and Make-up Water and Process Water Piping	Pressure Test	Independent Testing Agency	CONTRACTOR
31 23 26	Compaction	Materials, (e.g., soil grain size distribution), Optimum Soil Density, and Field Tests (e.g., in-place density and moisture content)	Independent Testing Agency	CONTRACTOR
33 05 20	Backfilling Trenches	Materials, (e.g., soil grain size distribution), Optimum Soil Density, and Field Tests (e.g., in-place density and moisture content)	Independent Testing Agency	CONTRACTOR

Drawings / Specification Section	Specification Title	Test Description	Responsible for Performing	Responsible for Payment
33 08 00	Commissioning of Water Utilities	Tests on Sanitary Sewers, Storm Drains, Potable Water	Independent Testing Agency and CONTRACTOR	CONTRACTOR
Drawing S-02	Special Structural Inspection Tests per IBC 2018	Tests on Structural materials, workmanship, and performance	Independent Testing Agency	CONTRACTOR

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 40 00S

SECTION 01 50 00S
TEMPORARY FACILITIES AND CONTROLS

Add this Specification to the Contract Documents.

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes temporary utilities, access, structures, control plans, controls, and cleanup.

1.2 UTILITIES

A. Water

- 1. CONTRACTOR shall arrange for water to use for activities related to the Work.
- 2. All service connections will be made by CONTRACTOR at CONTRACTOR's expense.
- 3. CONTRACTOR will need to pay for this water per OWNER's standard rates.
- 4. Water will be used only to the extent required for construction.

B. Sanitary Facilities

- 1. Provide sanitary facilities for use by CONTRACTOR's employees, Subcontractors, and Suppliers working at the Site.
- 2. Provide sanitary facilities with lockable doors when in use.
- 3. Maintain in a clean and useable condition.
- 4. Maintain until completion of the Work unless ENGINEER or OWNER approves earlier removal.

C. Electricity and Lighting

- 1. CONTRACTOR may obtain temporary power supply from OWNER's existing electric service at the existing chlorinator building, and at the Booster Station site. Existing service voltage is 240-volt single phase at the chlorinator building. Existing service voltage is 208/480-volt, 3-phase at the Booster Station site. Provide weatherproof, grounded temporary electric power distribution system of sufficient size, capacity, and power characteristics to accommodate performance of the Work. Note that the service will be interrupted when CONTRACTOR constructs the new electrical service and during the service cutover.

2. OWNER will pay for power use for items including temporary lighting, construction tools, and similar items.
3. Provide circuits of adequate size and proper characteristics with ground fault interrupters. Run wiring overhead and rise vertically where wiring will be least exposed to damage from construction operations. Provide rigid steel conduit or equivalent raceways for wiring that must be exposed on grade, floors, decks or other areas of possible damage or abuse. All temporary wiring shall comply with NEC Article 590.
4. Provide identification warning signs at power outlets which are other than 110-120 volt power. Provide polarized outlets for plug-in type outlets, to prevent insertion of 110-120 volt plugs into higher voltage outlets.
5. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for use with power tools and equipment.
6. Provide only grounded extension cords and use “hard service” cords where exposed to abrasion or traffic. Use single lengths of extension cord or waterproof connectors to connect separate lengths of extension cords.
7. Provide temporary lighting to sufficiently illuminate Work areas. Protect lights with guard cages.
8. Comply with all applicable OSHA requirements.

1.3 TEMPORARY ENCLOSURES AND HEAT

- A. Provide secure, weathertight temporary enclosures and closures as required to retain heat so that specified temperatures can be maintained for the performance of the Work and to protect previously completed Work.
- B. Provide temporary closures over wall and floor openings.

1.4 CLEANING

- A. Clean the working area each day, remove all trash and waste materials, and maintain the Site in a neat and orderly condition throughout the construction period.
- B. Remove all garbage, litter, debris, and other materials attributable to the Work or construction activities that accumulates in the vicinity of the Site.
- C. See Specification Section 01 78 50S Closeout Procedures for additional cleaning information.

1.5 ROADS/DUST CONTROL

- A. Maintain roads and trails to provide access to the Site and all of OWNER’s and other’s facilities for the entire duration of the Work. Roads shall be passable for their intended use at all times in all weather conditions and shall be maintained in a graded and rut-free condition.

- B. Sequence Work within the right-of-way of public roads to minimize public disturbance.
- C. Provide and maintain temporary surfacing of roads and driveways necessary to maintain those in passable condition under all weather conditions by typical passenger vehicles. Temporary surfacing shall consist of graded rock and granular material as required to provide a stable driving surface.

1.6 SURFACE WATER POLLUTION PREVENTION PLAN (SWPPP)

- A. CONTRACTOR shall prepare a SWPPP and SWPPP permit application and obtain a SWPPP permit.
- B. ENGINEER has drafted a SWPPP for CONTRACTOR's consideration. This draft plan will be provided to CONTRACTOR in native electronic format upon Award.
- C. ENGINEER's draft SWPPP is at the end of this Supplemental Specification.

1.7 SIGNS, FENCES, BARRICADES, AND WATCHMEN

- A. No signs, billboards, or other advertisements shall be erected on the premises by CONTRACTOR without OWNER's written permission.
- B. If required by the Contract Documents or Laws and Regulations, provide and maintain warning lights, barricades, informational signs, and watchmen for the protection of the Work, the protection of persons and property, and control of traffic. From sunset to sunrise, provide each barricade located in public streets or areas of potential pedestrian traffic with at least two operational lights.
- C. Barricades shall be painted a color visible at night, and shall consist of, at a minimum, snow fence or a similar material securely anchored to prevent entry of small children or unknowing persons.
- D. At a minimum, barricades shall be required at all excavations that have potential to contain standing water, and at all excavations more than 18 inches deep with side slopes on any exposure steeper than 3 units of horizontal run to 1 unit of vertical rise.
- E. At a minimum, warning lights shall be required at both ends of all excavations within public streets where the original pavement surface has been removed until a paved surface has been restored to grade.
- F. Barricades, warning lights, and traffic control signage within public streets shall, at a minimum, meet the technical requirements of the Institute of Transportation ENGINEERS and the latest edition of the Minnesota Department of Transportation Standard Specifications for Construction.

1.8 TRAFFIC AND PEDESTRIAN SAFETY CONTROL MEASURES – TRAIL CONTROL PLAN

- A. In accordance with generally accepted construction practices, CONTRACTOR is responsible for jobsite conditions and safety procedures and programs, including safety

and health of all persons and property, on those portions of the project area affected by or used by CONTRACTOR, employees, subcontractors, agents, and others during performance of the Work. This requirement will apply continuously and not be limited to normal working hours. CONTRACTOR is responsible for the protection of property and the safety and health of its employees, subcontractors, suppliers, agents, and others within the project area.

- B. CONTRACTOR shall be responsible for keeping the site perimeter safe for the public on or adjacent to the Site for the duration of the Work. CONTRACTOR shall be responsible for all site safety precautions.
- C. CONTRACTOR shall prepare a written Trail Control Plan that describes the measures that CONTRACTOR will use to inform the pedestrians at the perimeter of the Work the status of trails and to install, maintain and remove signs, barricades and similar devices to help prevent accidental pedestrian entrance to the active Work area.

1.9 TRAFFIC PERMITS

- A. Obtain any permits from federal, state, or local agencies necessary for traffic control or road closings necessary for completion of the Work. Perform Work in accordance with requirements of all permits. OWNER does not believe any traffic permits and traffic control plans are required for the Work.

1.10 TRAFFIC PUBLIC NOTICE

- A. CONTRACTOR shall be responsible for any public notice regarding work in the right of way, road closings or detours as required by federal, state, or local agencies. OWNER does not believe any traffic public notices are required for the Work.

1.11 ACCESS

- A. CONTRACTOR shall limit access to each work area as shown on the Drawings unless other arrangements are approved by OWNER.
- B. All public roadways and private driveways not shown as closed shall remain in service during construction, unless noted otherwise.
- C. Inspect and sweep paved surfaces to prevent dirt and mud from being tracked off site.

1.12 SECURITY

- A. Maintain fence between active work areas and all public areas. Repair damage to fence caused by construction activities immediately. Notify OWNER of fence damage caused by others and any damage to the Work.

1.13 FIELD OFFICE(S)

A. Field Office(s)

1. CONTRACTOR shall provide a weather-tight field office(s) for use by CONTRACTOR and Subcontractors.
2. Coordinate Field Office location(s) with OWNER.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 DISSCONNECT AND REMOVAL

- A. Disconnect any temporary power and water supply upon project completion and remove CONTRACTOR-supplied sanitary facilities upon project completion.
- B. Remove all SWPPP components including accumulated sediment and trash and restore to pre-Work conditions.
- C. Remove all Traffic and Trail Control Plan components and restore to pre-Work conditions.

PART 4 BASIS OF COMPENSATION

4.1 SWPPP

- A. CONTRACTOR will be paid for all labor, equipment, and materials to prepare and submit the SWPPP permit application, to implement the approved SWPPP, and to maintain, remove and restore the pollution prevention components with the SWPPP Bid item(s).

4.2 TRAFFIC CONTROL PLAN AND TRAFFIC/TRAIL CONTROL PLAN

- A. CONTRACTOR will be paid for all labor, equipment, and materials to prepare and submit the Traffic Control Plan and Traffic/Trail Control Plan, to implement the approved Control Plans, and to install, maintain, and remove the Control Plan components with the Traffic Control Plan Bid Item and the Traffic / Trail Control Plan Bid item.

4.3 ALL OTHER REQUIREMENTS OF THIS SPECIFICATION

- A. All other costs to comply with the requirements of this Section shall be considered to be included in the Contract Price.

END OF SECTION 01 50 00S

Memorandum

To: Bidders
From: Barr Engineering
Subject: Stormwater Pollution Prevention Plan - Outstanding Items
Date: 3/14/23
Project: Rock Canyon ASR Booster Station, Transmission Line, or Rock Canyon Tank Fill Line
c: [Click or tap here to enter text.](#)

Barr Engineering has prepared a Storm Water Pollution Prevention Plan (SWPPP) for the Rock Canyon ASR Booster Station & Transmission Line projects. This SWPPP will be included in bid documents, which require that the Owner or Contractor shall complete the sections listed below following bid selection.

Outstanding SWPPP items needed from Owner or Contractor are the following:

- Operator and Primary SWPPP Contacts
- Storm Team Contacts
- 2.3 phase/sequence of Construction Activity from Phase I and Phase II contractors
- Section 3.4 & Section 6 – Contractor shall develop a spill prevention & control plan for construction spill risks in and near Rock Canyon Creek, such as fuels & hydraulic oils for machinery.
- Fill in 4.1 Potential Sources of Pollution based on any stucco or paint activities as well as any other building materials and construction processes for pumphouse, paving, and discharge facilities.
- Add any applicable sections needed to 5.1 Erosion and Sediment Controls
- Identify responsible employee to 6.1 and add any applicable sections needed to 6.2 Pollution Prevention Controls
- Fill out and sign Section 10, Certification
- Appendices B through I

Storm Water Pollution Prevention Plan

for:

Rock Canyon ASR Booster Station, Transmission Line,
or Rock Canyon Tank Fill Line
Temple View Drive, 2300 N, Rock Canyon
Provo, Utah, 84604

Operator:

Insert Company or Organization Name
Insert Name
Insert Address
Insert City, State, Zip Code
Insert Telephone Number
Insert Fax/Email

Primary SWPPP Contact

Insert Company or Organization Name
Insert Name
Insert Address
Insert City, State, Zip Code
Insert Telephone Number
Insert Fax/Email

SWPPP Preparation Date:

3/22/2023

UPDES Permit Tracking Number*:

UTR_____

**This is the unique number assigned to your project after you have applied for coverage under the Utah Pollutant Discharge Elimination System (UPDES) construction general permit. If this template is filled out first, you can leave the tracking number blank until after you have applied for coverage.*

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Appendix B – NOI

Appendix C – Inspection Reports

Appendix D –Corrective Action Report

Appendix E – Subcontractor Certifications/Agreements/Delegation of Authority

Appendix F – Training Logs (CGP Part 6) and Certifications

Appendix G – Additional Information (i.e., Other permits and out of date SWPPP documents)

Appendix H – BMP Specifications
Appendix I – Construction General Permit

SECTION 1: CONTACT INFORMATION/ RESPONSIBLE PARTIES

Instructions (CGP 7.3.1./7.3.7.):

- Identify the staff members that are part of the project’s storm water team as well as their responsibilities. The storm water team is comprised of individuals who are responsible for the development of the SWPPP, any later modifications to it, installing and maintaining storm water controls, conducting site inspections, and making corrective actions where required.
- Each member of the storm water team must have ready access to either an electronic or paper copy of the 2019 CGP and the SWPPP.
- Starting January 1, 2021: A SWPPP writer for a site greater than 5 acres, with a perennial surface water within 50 feet of the project, or with a steep slope (70% or 35 degrees or more) must hold a certification to demonstrate that they are a “qualified person” per CGP Part 7.2. A certification page is located in Section 11.
- The following personnel, at a minimum, must receive training on their responsibilities (CGP Part 7.3.7/6.1):
 - ✓ Personnel who are responsible for the design, installation, maintenance, and/or repair of storm water controls (including pollution prevention measures);
 - ✓ Personnel responsible for the application and storage of treatment chemicals;
 - ✓ Personnel who are responsible for conducting inspections (must hold a certification) as required in Part 4.1.; and
 - ✓ Personnel who are responsible for taking corrective actions as required in Part 5.
- A sample training log is provided in Appendix F. Certifications can also be recorded in this appendix.

1.1 Storm Water Team

Name and/or Position, and Contact	Responsibilities, Qualifications, and Training
Insert name of responsible person Insert Company Name Insert Position Insert Telephone Number Insert Email	Insert Responsibility, Qualifications, and Trainings
Insert name of responsible person Insert Company Name Insert Position Insert Telephone Number Insert Email	Insert Responsibility, Qualifications, and Trainings
Insert name of responsible person Insert Company Name Insert Position Insert Telephone Number Insert Email	Insert Responsibility, Qualifications, and Trainings

[Insert or delete rows as necessary.]

SECTION 2: NATURE OF CONSTRUCTION ACTIVITIES

2.1 Construction Site Estimates

Instructions (CGP 7.3.2.b.-c.):

- Estimate the area to be disturbed by excavation, grading, or other construction activities, including dedicated off-site borrow and fill areas.

The following are estimates for the construction site.

Total project area (lot size): 3.1 acres
Construction site area to be disturbed: 3.1 acres

2.2 Construction Activity Descriptions

Instructions (CGP 7.3.2.a., d. & g.):

- Briefly describe the nature of the construction activity and approximate time frames.
- For more information see CGP Part 7.3.2 and *SWPPP Guide*, Chapter 3.A.

Describe the general scope of the work for the project, major phases of construction, etc:

New culinary water booster station is proposed with water and sanitary sewer connections as well as site walks and paving adjacent to an existing water tank. A 24” transmission line is proposed which will extend from the booster station into rock canyon creek where an outlet structure is proposed. The project is approximately 6900 feet long.

Describe any on-site and off-site construction support activity areas:

Laydown areas are proposed in parking lot of Rock Canyon entrance before entering US Forest property & adjacent to the booster station.

Typical site business days and times:

7:00AM-6:00PM

2.3 Phase/Sequence of Construction Activity

Instructions (CGP 7.3.2.e.):

- Describe the intended construction sequencing and timing of major activities, including any opportunities for phasing grading and stabilization activities to minimize the overall amount of disturbed soil that will be subject to potential erosion at one time. Also, describe opportunities for timing grading and stabilization so that all or a majority of the soil disturbance occurs during a time of year with less erosion potential (i.e., during the dry or less windy season).
- For more information, see *SWPPP Guide*, Chapter 4, ESC Principle 2. It might be useful to develop a separate, detailed site map for each phase of construction.

Phase I

- Describe phase and activities
- Duration of phase (start date, end date)
- List BMPs associated with this phase
- Describe stabilization methods for this phase (describe any temporary stabilization methods that will be used before final stabilization)

Phase II

- Describe phase and activities
- Duration of phase (start date, end date)
- List BMPs associated with this phase
- Describe stabilization methods for this phase (describe any temporary stabilization methods that will be used before final stabilization)

[Repeat as needed]

2.4 **Maps**

Instructions (CGP 7.3.3.):

- Attach site maps. For most projects, a series of site maps is recommended. The first should show the undeveloped site and its current features. An additional map or maps should be created to show the developed site or for more complicated sites show the major phases of development.

These maps should include the following:

- Boundaries of the property
- Locations of earth-disturbing activities, including demolition, and note any phasing;
- Direction(s) of storm water flow and approximate slopes before and after major grading activities;
- Type and extent of pre-construction cover (vegetative cover, pavement, etc.);
- Locations of stockpiles and material storage;
- Water crossings and all water of the state within one mile downstream of the site's discharge point;
- Designated points where vehicles enter onto paved roads;
- Locations of structures and other impervious surfaces upon completion of construction;
- On-site and off-site construction support activity areas covered by the permit;
- Storm water and authorized non-storm water discharge locations to inlets or waters of the state;
- Locations of all potential pollutant-generating activities;
- Locations of storm water controls, including natural buffer areas; and
- Locations where polymers, flocculants, or other treatment chemicals will be used and stored.
- For more information, see *SWPPP Guide*, Chapter 3.C.

The SWPPP site map(s) are filed in Appendix A

SECTION 3: WATER QUALITY

3.1 Discharge Information

Instructions(CGP 1.4.):

- A Municipal Separate Storm Sewer System (MS4) is a storm water conveyance system owned and operated by a state, city, town, county, district, association, or other public body. If you discharge to one of these systems mark “yes” and identify which MS4. You must submit your SWPPP to this MS4 for review. A list of MS4s that are currently designed under a Utah municipal storm water permit can be found here: <https://documents.deq.utah.gov/water-quality/stormwater/DWQ-2018-006843.xlsx>

Does your project/site discharge storm water into a Municipal Separate Storm Sewer System (MS4)? Yes No

List the MS4 that receives the discharge from the construction project: [Provo City Stormwater Service District](#)

3.2 Receiving Waters

Instructions (CGP 3.1.):

- In the below table, list the name of the first surface water(s) that would receive discharges from your site. Multiple rows are provided in case your site discharges in multiple locations which flow to different surface waters. For discharges that enter a storm sewer system prior to discharge, the first surface water to which you discharge is the water body that receives the storm water discharge from the storm sewer system. You may need to contact the storm sewer system owner to find out where it discharges to.
- See <http://wg.deq.utah.gov> for impairment or quality information. Use this to identify the status in column 2 of Table 1. Select the waterbody you wish to look-up and find the results from the 20XX Assessment on the left hand side.
- For more information on TMDLs and impaired waters visit <https://deq.utah.gov/water-quality/watershed-monitoring-program/approved-tmdls-watershed-management-program> or www.epa.gov/tmdl/impaired-waters-and-stormwater.
- If any of the surface waters you listed are impaired, provide specified information about pollutants causing the impairment in column 3 of Table 1. Your SWPPP should specifically include measures to prevent the discharge of these pollutants.
- If any of the surface waters you listed are identified as a Category 1 or 2 water (a Category 1 water is only found within Forest Service boundaries) provide the category in column 3 of Table 1.
- For more information, see CGP Part 3.1 and 3.2 and *SWPPP Guide*, Chapter 3.B.

Names of Receiving Waters

Name of Receiving Water (first surface water that receives storm water or where storm system discharges to)	Is the water impaired or high quality?	If high quality: Is it Category 1 or 2? If impaired: List pollutants that the waterbody is impaired for
1. Rock Canyon Creek	<input type="checkbox"/> Not high quality/impaired <input type="checkbox"/> Impaired, has approved TMDL <input type="checkbox"/> Impaired, no TMDL <input checked="" type="checkbox"/> High quality	Category 1
2. Provo River (between Utah Lake & Murdoch Diversion)	<input type="checkbox"/> Not high quality/impaired <input type="checkbox"/> Impaired, has approved TMDL <input checked="" type="checkbox"/> Impaired, no TMDL <input type="checkbox"/> High quality	

3.3 Impaired Waters

Instructions (CGP 3.2.):

- If you discharge to an impaired water as listed in the above table, provide information on additional efforts that will be taken to control the release of impairment causing pollutants. This is especially important for projects discharging to a surface water with an EPA approved TMDL for sediment or nutrients and an extra effort must be provided to prevent sediment from leaving the site.

Description of additional precautions taken if you are discharging to an impaired surface water. State if no impairment causing pollutants are on site:

Storm Sewers are the primary mechanism for site storm water releases into the Provo River. Storm Sewer inlets will be protected from sediment entry. Additionally, stockpiled soil will be minimized where possible, and sediment mobilization will be minimized using gravel socks around stockpiles.

3.4 High Water Quality

Instructions (CGP 3.2.):

- If you discharge to a high quality water as listed in the above, provide information on additional efforts that will be taken to control the release of pollutants. Per CGP Part 1.1.7, you can discharge to a Category 1 water if your discharge is temporary and limited and where best management practices will be employed to minimize pollution effects. Discharge to Category 2 waters is allowed only if the discharge will not lower the water quality of the water body.

Description of additional precautions taken to minimize pollution effects if you are discharging to a high quality surface water:

Where the construction area is near Rock Canyon Creek, silt fence and straw wattle will be used to protect the stream from sediment entry.

The construction area is within Rock Canyon Creek at the North Side Discharge (STA 66+00 ±). Construction will not occur when water is flowing within Rock Canyon Creek (it is an ephemeral water source). Additionally, silt fences will be maintained around the construction limits this area, until the construction area is beyond 20-ft from the creek bank.

A spill prevention plan & control plan will be established for work in & near Rock Canyon Creek.

SECTION 4: POLLUTION PREVENTION STANDARDS

4.1 Potential Sources of Pollution

Instructions (CGP 7.3.2.f.):

- Identify and list all potential sources of sediment, which may reasonably be expected to affect the quality of storm water discharges from the construction site.
- Identify and describe all potential sources of pollution or pollutant-generating activity (e.g., paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal), other than sediment, which could be exposed to rainfall or snowmelt, and may reasonably be expected to discharges from the construction site.

For more information, see *SWPPP Guide*, Chapter 3.A.

Pollutant-Generating Activity	Pollutants or Pollutant Constituents (that could be discharged if exposed to storm water)	Location on Site (or reference SWPPP site map where this is shown)
Concrete Placement	Concrete Washout Waters-grey liquid- pH , Concrete Curing Compound-creamy white liquid- Naphtha ,	Booster Station
Earthwork Machinery	Oils-brown oily petroleum hydrocarbon- Mineral Oil , Grease, Fuels-colorless-pale brown/yellow-pink-blue green hydrocarbon- Benzene, ethyl benzene, toluene, xylene, MTBE, petroleum distillate, oils/greases, naphthalene, coal oil	Booster Station, Roadway, & USFS property
Trash generation from materials	Cardboard, paint, plastic, metal containers, etc.	Booster Station, Roadway, & storage/ laydown areas
Asphalt Paving	Black solid- oil petroleum distillates	Booster Station & Roadway
Earthwork & soil stockpiles	Mobilized sediment	Booster Station, Roadway, & USFS property

[Include additional rows as necessary.]

4.2 Non-Storm Water Discharges

Instructions (CGP 7.3.4.):

- Identify all allowable sources of non-storm water discharges and how they will be controlled. A list of allowable non-storm water discharges are found in the CGP Part 1.2.3.
- For more information, see *SWPPP Guide*, Chapter 3.A.

Check allowable non-storm water discharges that are present and describe the measures used to reduce them or prevent them from contributing pollutants to discharges:

Authorized Non-Storm Water Discharges	Present	Comments/Controls
Discharges from emergency fire-fighting activities	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
Fire hydrant flushing	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	New hydrant installation included flushing of the fire hydrants to ensure lines are clean and have no residual chlorine. No hyper-chlorinated water discharges (from water line disinfection) will be allowed.
Properly managed landscape irrigation (excludes fertilizer injector systems)	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
Properly managed vehicle and equipment wash water with no soaps, solvents, or detergents	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Concrete trucks are rinsed on the pumphouse site without the use of detergents. Wash water is retained on the site.
Water used to control dust	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Water is used during development to control dust on roadways under construction.
Drinking water, includes uncontaminated water line flushing	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Domestic drinking water supply lines are flushed to ensure lines are clean and have no residual chlorine. No hyper-chlorinated water discharge (from water lines disinfection) will be allowed.
External building washdown with no soaps, solvents, detergents, or hazardous substances	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Pressure washing of buildings occurs without use detergents, or other solutions that have received chemicals to alter pH. Washing occurs only as needed.
Pavement wash waters with no detergents or toxic or hazardous materials. Must have a sediment basin, sediment trap, of similarly effective control prior to discharge.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Pavement shall be swept prior to wash down. Wash down will occur without detergents or other toxic or hazardous materials.
Uncontaminated air conditioning or compressor condensate	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
Uncontaminated, non-turbid discharges of ground water (from natural sources) or spring water	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	

Uncontaminated foundation or footing drains	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
---------------------------------------------	------------------------------------------------------------------	--

4.3 Dewatering Practices

Instructions (CGP 1.2.5. and 2.3.7.):

If you will be discharging storm water that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, it must be permitted by UPDES permit UTG070000 (Construction Dewatering and Hydrostatic Testing Permit) unless it can be managed onsite through percolation or evaporation. The permit can be found at <https://deg.utah.gov/water-quality/current-updes-permits> in the bottom table. Call DWQ at 801-536-4300 for more information.

- Include schedule and general locations of dewatering. Dewatering locations must be on the site map.

Check box if section not applicable to this site (Note: If not applicable skip to next section)

Describe the general scope of dewatering practices for the project and any BMPs used to manage the dewatering practices:

NA

4.4 Natural Buffers or Equivalent Sediment Controls

Instructions (CGP Part 7.3.5.b.(1), 2.2.1, and Appendix A):

This section only applies if a surface water is located within 50 feet your construction activities. If this is the case, review CGP Part 2.2.1. and Appendix A of the CGP for information on how to comply with the buffer requirements.

- Describe the compliance alternative that was chosen to meet the buffer requirements, and include any required documentation supporting the alternative selected. The compliance alternative selected must be maintained throughout the duration of permit coverage. However, if you select a different compliance alternative during your period of permit coverage, you must modify your SWPPP to reflect this change.
- If you qualify for one of the exceptions in CGP Part A.2.2., include documentation related to your qualification for such exceptions.
- Review Appendix A of the CGP for step-by-step instructions and examples on how to comply with the different buffer alternatives.

Buffer Compliance Alternatives

Are there any surface waters within 50 feet of your project's earth disturbances?

YES NO

(Note: If "no", no further documentation is required. Delete the rest of Section 4.3 below this point.)

List the water body: [Rock Canyon Creek](#)

Check the compliance alternative that you have chosen:

I will provide and maintain a 50-foot undisturbed natural buffer around the surface water.

It is infeasible to provide and maintain a full 50-foot undisturbed natural buffer. I will provide and implement erosion and sediment controls to achieve the required sediment load reduction for my conditions.

- Reason that a 50' buffer could not be maintained: [Beyond STA 63+00, there is not sufficient room to maintain a 50' buffer. Before reaching that a 50' buffer will be maintained.](#)
- Width of buffer that will be retained: [a 20' buffer will be maintained until STA 65+75, where work within the Rock Creek Channel is required.](#)
- Additional controls used to achieve equivalent sediment load reduction of a 50' buffer: [Silt Fence & Straw Wattle installation.](#)
- Description of the calculations and assumptions used to determine sediment load reductions: [No calculations were performed since this is a small portion of the project. Best management practices are assumed to be sufficient.](#)

The project qualifies as "small residential lot" disturbing less than an acre. The natural buffer is preserved in accordance with CGP A.2.3., storm water is treated by site erosion and

sediment controls before discharge, natural buffers are shown on the site map, and buffer areas are marked on site. Select one of the 2 alternatives for small residential lots:

- Alternative 1: Using Table A-1 in CGP for requirements
 - Width of buffer that will be retained:
 - Additional controls to be used:
- Alternative 2: Using Tables A-2 through A-7 in CGP for requirements
 - Width of buffer that will be retained:
 - Sediment Risk Level Determined:
 - Additional controls to be used:

I qualify for one of the exceptions in Part A.2.2. (If you have checked this box, provide information on the applicable buffer exception that applies, below.)

There is no discharge of storm water through the area between the disturbed portions of the site and the surface water that is located within 50 feet.

No natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for this project. *This applies to the portion of the project within the roadway as well as the booster station site, which has been previously developed.*

For a linear project, site constraints (e.g., limited right-of-way) make it infeasible for me to meet any of the compliance alternatives.

- Reason it is infeasible:
- Buffer width retained or supplemental controls used:

Buffer disturbances are authorized under a CWA Section 404 permit.

- Describe earth disturbances in buffer area:

(Note: This exception does not apply to portions upland of the Section 404 permitted work.)

Buffer disturbances will occur for the construction of a water-dependent structure or water access area (e.g., pier, boat ramp, and trail).

- Describe earth disturbances in buffer area: *Construction of a water discharge & scour mitigation area within the stream bed is required near STA 66+00.*

SECTION 5: EROSION AND SEDIMENT CONTROLS – BMPS

5.1 *List of Erosion and Sediment BMPs on Site*

Instructions (CGP Part 2.2. and 7.3.5):

- Identify best management practices (BMPs) that will be implemented on site to control erosion and sediment transport from storm water.
- Use the below CGP requirements and the pollutant generating activities identified in SWPPP section 4.1. to determine where BMPs are necessary. Fill out the rightmost column with BMPs you are selecting. Some requirements may not apply to your site.
- For each BMP you must provide a description of the control, any design specifications, routine maintenance specifications, a schedule for storm water control implementation/installation, and the staff responsible for maintaining the BMP. These details are listed in the BMP section below the table.
- BMPs are listed as examples, you may use BMPs not listed.
- Details and design specifications can be provided in this section or in Appendix H if they are large.
- Perimeter control maintenance must include removal of sediment before it has accumulated to one-half the above-ground height of the control.
- For more information, see *SWPPP Guide*, Chapter 4.
- BMP guidance may be found in your MS4's or other local jurisdiction's design manual, guidance manuals listed in Appendix D of the *SWPPP Guide*, or EPA's National Menu of BMPs
<https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#constr>

CGP Requirement	Example BMPs	EPA SWPPP Guide Section	BMPs Selected (Name and Reference Number if applicable)
Preserve vegetation where possible and direct storm water to vegetated areas when feasible (CGP 2.2.2.)	Phasing to minimize disturbance, signs/fences to protect areas not being disturbed.	Chapter 4, ESC Principle 1	Silt Fence, Natural Vegetation
Install sediment controls along perimeter areas that receive pollutant discharges (CGP 2.2.3.).	Silt fence, fiber rolls, earth berms	Chapter 4, ESC Principle 7	Silt Fence
Minimize sediment track-out (CGP 2.2.4.)	Restrict access, stabilize exits, track-out pads, tire washing station, clean-up sediments	Chapter 4, ESC Principle 9	Stabilized Construction Entrance, Wash Down Area
Manage stockpiles with perimeter controls and locate away from storm water conveyances (CGP 2.2.5.)	Sediment barriers downgradient, proper location, covered stockpiles, diverting storm water from stockpiles	Chapter 4, ESC Principle 4	Grading BMP, Water Truck, Silt Fence
Minimize dust (CGP 2.2.6.)	Water application, mulching, chemical dust suppression techniques		Water Truck, Natural Vegetation
Minimize steep slope disturbance (CGP 2.2.7.)	Erosion control blankets, tackifiers, protect slopes from disturbance	Chapter 4, ESC Principle 5	NA
Preserve topsoil (CGP 2.2.8.)	Stockpile topsoil	Chapter 4, ESC Principle 1	NA
Minimize soil compaction where final cover is vegetation (CGP 2.2.9.)	Restrict vehicle access, recondition soils before seeding		Soils to be reconditioned adjacent to transmission line discharge location
Protect storm drain inlets (CGP 2.2.10.)	Inserts, rock-filled bags, covers	Chapter 4, ESC Principle 6	Gravel Socks
Slow down runoff with erosion controls and velocity dissipation devices (CGP 2.2.11.)	Check dams, riprap	Chapter 4, ESC Principle 3	NA

Appropriately design any sediment basins or impoundments (CGP 2.2.12.)	Design to 2-year 24-hour storm or 3,600 cubic feet per acre drained, include design specifications	Chapter 4, ESC Principle 8	NA
Follow requirements for any treatment chemicals (polymers, flocculants, coagulants, etc.)	Store in leak proof containers and cover, proper training, minimize use		NA
Stabilize exposed portions of site with 14 days of inactivity (CGP 2.2.14).	Seeding, erosion control blankets, gravel, hydromulch	Chapter 9	Gravel will be placed in applicable USFS road areas, seeding will be used where required.

5.1.1: [Preserve Natural Vegetation – see Appendix H](#)

BMP Description/Instructions: A natural vegetation buffer shall be maintained where feasible.

<i>Installation Schedule:</i>	Beyond STA 42+00 natural vegetation is abundant and shall be protected where possible.
<i>Maintenance and Inspection:</i>	Inspections shall occur to document incidental vegetation disturbances that will require revegetation at project completion. Twice weekly inspection schedule
<i>Responsible Staff:</i>	
<i>Design Specifications and Drawings:</i>	

5.1.2: [Silt Fence, Gravel Socks, & Straw Wattle – see Appendix H](#)

BMP Description/Instructions: Along linear portions of the project, stockpiles are allowed outside of designated areas. They must be protected by gravel socks at the stockpile toe when left in place outside of working hours or during rainfall events. Stockpiles outside of linear project areas shall be protected by silt fence or gravel socks as appropriate.

<i>Installation Schedule:</i>	Before the end of the work shift once new stockpiles are created.
<i>Maintenance and Inspection:</i>	Inspected with every storm water inspection (frequency noted in section 8.1) and maintenance conducted as needed
<i>Responsible Staff:</i>	
<i>Design Specifications and Drawings:</i>	

5.1.3: [Inlet Protection – see Appendix H](#)

BMP Description/Instructions: *Stormwater inlets shall be protected.*

Installation Schedule:	At the beginning of the project
Maintenance and Inspection:	<ul style="list-style-type: none"> • After each rainfall event and at a minimum of monthly. • Repair any damage.
Responsible Staff:	
Design Specifications and Drawings:	

5.1.4: [Stabilized Construction Entrance – see Appendix H](#)

BMP Description/Instructions:

Installation Schedule:	Prior to disturbance of US Forest Service Lands
Maintenance and Inspection:	Inspect daily for loss of gravel or sediment buildup.
Responsible Staff:	
Design Specifications and Drawings:	

5.1.5: [Water Truck – see Appendix H](#)

BMP Description/Instructions:

Installation Schedule:	During construction, especially during windy periods
Maintenance and Inspection:	It will be determined on as needed basis when water is needed to inhibit the creation of dust.
Responsible Staff:	
Design Specifications and Drawings:	

[Repeat as needed]

Instructions (CGP 7.3.5.b.(2)):

- For areas where perimeter controls are not feasible on a linear construction site, include a description of why it is not feasible and other practices that will be implemented to minimize discharges of pollutants from the site.

5.2 Linear Site Perimeter Control Exemption

Check box if section not applicable to this site ([Note: If not applicable skip to next section](#))

If the site is linear and perimeter controls are not feasible, describe other practices in use: Limit excavation to 100 feet of length at a time and compact soils and aggregate in preparation for paving. Stockpiles along linear project portions shall be protected from sediment mobilization by installing gravel socks at the stockpile toe for all stockpiles that will be left in place at the end of the work day and at all stockpiles prior to precipitation events.

5.3 Final Stabilization

Instructions (CGP 7.3.5.b.(6) and 2.2.14.b.):

- Describe procedures for final stabilization. If final cover is vegetation, you must establish uniform perennial vegetation that provides 70% or more of the vegetative cover that existed prior to earth-disturbing activities. Exception: Arid, semi-arid, and drought stricken areas are required to be seeded/planted so that the before mentioned vegetative requirement is expected to be met within 3 years. Establishment of vegetation is not required, however additional erosion controls may be needed.
- You can amend or add to this section as areas of your project are finally stabilized.
- Update your site plans to indicate areas that have achieved final stabilization.

Description of final stabilization practices and schedule:

Type of stabilization (vegetation/landscaped, graveled, paved, etc.)	Location	Implementation Schedule
Seed Mix, see specs	Rock Canyon	After Paving, where applicable along trail, reach 100% coverage and 70% density coverage
Pumphouse and Concrete	Booster Station	After Earthwork
Asphalt Pavement	Booster Station & Roadway	Following completion of transmission line installation within the roadway.

SECTION 6: BMPS - POLLUTION PREVENTION/OPERATIONAL CONTROLS

6.1 Spill Prevention and Response

Instructions CGP Part 7.3.5.b.(7):

- Describe the spill prevention and control plan. Include ways to reduce the chance of spills, stop the source of spills, contain and clean up spills, dispose of materials contaminated by spills, and train personnel responsible for spill prevention and control.
- Some projects/site may be required to develop a Spill Prevention Control and Countermeasure (SPCC) plan under a separate regulatory program (40 CFR 112). If you are required to develop an SPCC plan, or you already have one, you should include references to the relevant requirements from your plan.
- The plan must include the materials and method of containment and for flowing liquid, cleanup, disposal and follow the minimum spill controls below.
- For more information, see *SWPPP Guide*, Chapter 5, P2 Principle 6.

Describe spill procedures and materials available for expeditious containment, clean-up and disposal of spills:

Identify the employee responsible for detection and response of spills and leaks:
INSERT TEXT HERE

Any discharges in 24 hours equal to or in excess of the reportable quantities listed in 40 CFR 117, 40 CFR 110, and 40 CFR 302 will be reported to the National Response Center and the Division of Water Quality (DWQ) as soon as practical after knowledge of the spill is known to the permittees. The permittee shall submit within 14 calendar days of knowledge of the release a written description of: the release (including the type and estimate of the amount of material released), the date that such release occurred, the circumstances leading to the release, and measures taken and/or planned to be taken to the Division of Water Quality (DWQ), 288 North 1460 West, P.O. Box 144870, Salt Lake City, Utah 84114-4870. The Storm Water Pollution Prevention Plan must be modified within 14 calendar days of knowledge of the release to provide a description of the release, the circumstances leading to the release, and the date of the release. In addition, the plan must be reviewed to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and the plan must be modified where appropriate.

Agency	Phone Number
National Response Center	(800) 424-8802
Division of Water Quality (DWQ) 24-Hr Reporting	(801)-231-1769 (801) 536-4123
Utah Department of Health Emergency Response	(801) 580-6681

Material	Media Released To	Reportable Quantity
Engine oil, fuel, hydraulic & brake fluid	Land	25 gallons
Paints, solvents, thinners	Land	100 lbs (13 gallons)
Engine oil, fuel, hydraulic & brake fluid	Water	Visible Sheen
Antifreeze, battery acid, gasoline, engine degreasers	Air, Land, Water	100 lbs (13 gallons)
Refrigerant	Air	1 lb

6.2 Pollution Prevention Controls

Instructions (CGP Part 2.3. and 7.3.5):

- Describe the key good housekeeping and pollution prevention (P2) BMPs that will be implemented to control pollutants in storm water (CGP Part 2.3).
- Use the below CGP requirements and the pollutant generating activities identified in SWPPP section 4.1. which were not addressed with the erosion and sediment BMPs to determine where BMPs are necessary.
- For each BMP you must provide a description of the control, any design specifications, routine maintenance specifications, a schedule for storm water control implementation/installation, and the staff responsible for maintaining the BMP.
- BMPs are listed as examples, you may use BMPs not listed.
- Details and design specifications can be provided in this section or in Appendix H.
- For more information, see *SWPPP Guide*, Chapter 5.
- Consult your state’s or local jurisdiction’s design manual or resources in Appendix D of the *SWPPP Guide*.
- For more information or ideas on BMPs, see EPA’s National Menu of BMPs
<https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#constr>

CGP Requirements	Example BMPs	EPA SWPPP Guide Section	BMPs Selected (Name and Reference Number if applicable)
Equipment and vehicle fueling (CGP 2.3.1)	Spill kits, SPCCP, drip pans, locate activities away from conveyances, use secondary containment	Chapter 5, P2 Principle 4	Prevent spill and leaks, and reduce their impacts to storm water fueling and doing maintenance in designated areas only, this area must be located away from drainage courses.
Equipment and vehicle washing (CGP 2.3.2.)	Locating away from surface waters and storm water conveyances, directing wash waters to a sediment basin or	Chapter 5, P2 Principle 5	If washing must occur on-site, use designated, bermed areas to prevent wash water

	sediment trap, using filtration devices		contact with storm water, creeks, rivers and other water bodies. The wash area can be sloped for wash water collection and subsequent infiltration into the ground
Storage, handling, and disposal of building products and waste (CGP 2.3.3.)	Cover (plastic sheeting / temporary roofs), secondary containment, leakproof containers, proper dumpsters, secured portable toilets, locate away from storm water conveyances	Chapter 5, P2 Principle 1 and 2	Use all of the product before disposing of the container Do not remove the original product label
Washing of stucco, paint, concrete, form release oils, curing compounds, etc. (CGP 2.3.4.)	Leak proof containers, lined pits, locate away from storm water conveyances	Chapter 5, P2 Principle 3	Use leak proof containers and dispose offsite
Properly apply fertilizer (CGP 2.3.5)	Follow manufacture specifications, document deviations in applications, avoid applications to frozen ground, before heavy rains, or to storm water conveyances		

6.2.1.: [Waste Disposal \(dumpster\)](#)– see [Appendix H](#)

BMP Description/Instructions:

<i>Installation Schedule:</i>	Dumpsters shall be available at project laydown areas at all times.
<i>Maintenance and Inspection:</i>	Dumpsters shall be emptied when full and inspected weekly at a minimum.
<i>Responsible Staff:</i>	
<i>Design Specifications and Drawings:</i>	

6.2.2.: [Portable Toilets \(dumpster\)– see Appendix H](#)

BMP Description/Instructions:

Installation Schedule:	Portable toilets shall be available at project laydown areas at all times. A mobile toilet on a trailer shall accompany the pipe crew along linear portions of the project.
Maintenance and Inspection:	Toilets shall be emptied when full and inspected weekly at a minimum.
Responsible Staff:	
Design Specifications and Drawings:	

6.2.3.: [Concrete Waste Management– see Appendix H](#)

BMP Description/Instructions: Designated concrete washout areas shall be available.

Installation Schedule:	Concrete washout shall be available prior to the start of concrete pouring.
Maintenance and Inspection:	Prior to concrete pours.
Responsible Staff:	
Design Specifications and Drawings:	

6.2.4: (Place name of BMP here – reference to detailed instructions in Appendix H if necessary)

BMP Description/Instructions:

Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	
Design Specifications and Drawings:	

6.2.5: (Place name of BMP here – reference to detailed instructions in Appendix H if necessary)

BMP Description/Instructions:

Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

<i>Design Specifications and Drawings:</i>	
6.2.6: (Place name of BMP here – reference to detailed instructions in Appendix H if necessary)	
<i>BMP Description/Instructions:</i>	
<i>Installation Schedule:</i>	
<i>Maintenance and Inspection:</i>	
<i>Responsible Staff:</i>	
<i>Design Specifications and Drawings:</i>	

[Repeat as needed]

SECTION 7: SPECIAL CONDITIONS

Instructions:

The conditions listed below require additional details or actions added to your SWPPP. If they do not apply you may delete them from this SWPPP.

7.1 Emergency Related Projects

Instructions (CGP 1.1.5):

- For emergency activities that require immediate authorization but last longer than 30 days, a SWPPP may be submitted within 30 days of starting work.
- To be an emergency related project it must be considered a public emergency and the cause must be documented along with the description of necessary construction to reestablish effected public services.

Emergency-Related Project? Yes No

7.2 UIC Class 5 Injection Wells

Instructions (CGP 7.3.8.):

- If you are using any of the following storm water controls at your site as they are described below, you must document any contact you have had with DWQ for implementing the requirements for underground injection wells in the Safe Drinking Water Act and DEQ's implementing regulation at UAC R317-7.
- There may be additional local requirements related to such structures
- For the State UIC Contact at DWQ call (801) 536-4300.

Check box if section not applicable to this site

Class V UIC Wells on site (all must be reported to DWQ for inventory):

- Infiltration trenches (if storm water is directed to any shaft or hole that is deeper than its widest surface dimension or has a subsurface fluid distribution system)
- Commercially manufactured pre-cast or pre-built subsurface detention vault/infiltration system
- Drywell, seepage pit, or improved sinkhole (if storm water is directed to any shaft or hole that is deeper than its widest surface dimension or has a subsurface fluid distribution system)

Description of your Class V Injection Well and any local requirements:

[INSERT DESCRIPTION AND ANY DWQ OR LOCAL REQUIREMENTS](#)

Description of any additional BMPs used in conjunction with the UIC well.

7.2.1: (Place name of BMP here – reference to detailed instructions in Appendix H if necessary)

BMP Description/Instructions:

<i>Installation Schedule:</i>	
<i>Maintenance and Inspection:</i>	
<i>Responsible Staff:</i>	
<i>Design Specifications and Drawings:</i>	

7.3 Chemical Treatment

Instructions (see CGP 2.2.13. and 7.3.5.b.(5)):

- If you are using treatment chemicals at your site, provide details for each of the items below. This information is required as part of the SWPPP requirements in CGP Part 7.2.9.b.

Check box if section not applicable to this site (Note: If not applicable skip to next section)

Soil Types

List all the soil types (including soil types expected to be found in fill material) that are expected to be exposed during construction and that will be discharged to locations where chemicals will be applied:

Treatment Chemicals

List all treatment chemicals that will be used at the site and explain why these chemicals are suited to the soil characteristics:

Describe the dosage of all treatment chemicals you will use at the site or the methodology you will use to determine dosage:

Provide information from any applicable Safety Data Sheets (SDS):

Describe how each of the chemicals will stored:

Include references to applicable state or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer’s specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems:

Special Controls for Cationic Treatment Chemicals (if applicable)

If you have been authorized by DWQ to use cationic treatment chemicals, identify the specific controls and implementation procedures you are required to implement to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards or harm aquatic life:

Schematic Drawings of Storm Water Controls/Chemical Treatment Systems

Provide schematic drawings of any chemically-enhanced storm water controls or chemical treatment systems to be used for application of treatment chemicals:

Training

Describe the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to the use of treatment chemicals:

SECTION 8: INSPECTIONS & CORRECTIVE ACTIONS

8.1 Inspections

Instructions (CGP Part 4.2-4.4.3):

- Select an inspection schedule. These are minimum frequencies, you may inspect more frequently. If so describe what your schedule would be.
- For more on this topic, see *SWPPP Guide*, Chapters 6 and 8.
- Also, see suggested inspection form in Appendix B of the *SWPPP Guide*.

Minimum Inspection Schedule Requirements:

Standard Frequency:
<input type="checkbox"/> Once every 7 calendar days.
<input type="checkbox"/> Once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. Rain gauge/weather station used: Gauge or station for rainfall depth
Increased Frequency (if applicable):
<input checked="" type="checkbox"/> <i>Sites discharging to impaired or high quality waters:</i> Once every 7 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.
Decreased Frequency (if applicable):
<input checked="" type="checkbox"/> <i>Arid areas:</i> once a month and within 24 hours of a 0.5 inch storm event or greater.
<input type="checkbox"/> <i>Semi-arid areas:</i> once a month and within 24 hours of a 0.5 inch storm event or greater during the dry season: List months for dry season (also select the inspection schedule followed outside of the dry season).
<input type="checkbox"/> <i>Frozen conditions with work suspended – must have 3 months of continuous expected frozen conditions based on historical averages:</i> no inspections List months of suspended inspections (also select the inspection schedule followed when not frozen)
<input type="checkbox"/> <i>Frozen conditions with continued activities - must have 3 months of continuous expected frozen conditions based on historical averages:</i> once per month List months of frozen conditions (also select the inspection schedule followed when not frozen)
Other:
<input type="checkbox"/> Describe alternative frequency: List alternative schedule, must meet minimum requirements

Inspection Reports are filed in Appendix C

Inspection is required at the indicated decreased frequency from the project beginning to STA 42+00.

Inspection is required at the indicated increased frequency from STA 42+00 to the project end.

8.2 Corrective Actions

Instructions:

- A sample corrective action report is provided in Appendix D.
- Whenever a storm water control requires repair or replacement (beyond routine maintenance), a control necessary for permit compliance was never installed or was installed incorrectly, your discharges cause an exceedance of applicable water quality standards, or a prohibitive discharge has occurred, you must log corrective actions taken.
- This log should describe actions taken, date completed, whether a SWPPP modification was required.
- In some cases corrective actions may be documented on the inspection form. This is an acceptable alternative as long as corrective actions that occur outside of inspections are also documented.

Correction Action Report is filed in Appendix D.

8.3 Delegation of Authority

Instructions:

- Identify the individual(s) or specifically describe the position where the construction site operator has delegated authority for the purposes of signing inspection reports, certifications, or other information in Section 1.1 of the SWPPP.
- Each inspection report must be signed in accordance with CGP Part 9.16 of the permit.
- If a delegation letter is necessary, see Appendix E of this template and keep a signed copy with this SWPPP.
- For more on this topic, see *SWPPP Guide*, Chapter 7.

See the signed delegation of authority forms in Appendix E.

SECTION 9: RECORDKEEPING

9.1 *Recordkeeping*

Instructions (CGP 7.3.10. and 9.10.):

- The following is a list of records you must have accessible on site (electronically or paper) for inspectors to review:
 - ✓ A copy of the construction general permit (Appendix I)
 - ✓ The signed and certified NOI form or permit application form (Appendix B)
- Copies of the SWPPP and all reports required by the permit must be retained for at least three years from the date that the site is finally stabilized.
- For more on this subject, see *SWPPP Guide*, Chapter 6.C.

9.2 Log of Changes to the SWPPP

Instructions (CGP Part 7.5.3):

- Create a log here of changes and updates to the SWPPP. You should include additions of new BMPs, replacement of failed BMPs, significant changes in the activities or their timing on the project, changes in personnel, changes in inspection and maintenance procedures, updates to site maps, and so on.
- Instead of using the table, SWPPPs can also be redlined to show changes as long as the redlines are initialed and dated.

Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]

SECTION 10: CERTIFICATION

Instructions:

- The SWPPP should be signed and certified by the owner and/or the general contractor. Attach a copy of the NOI and a copy of the General Storm Water Permit for Construction Activity. You can get a copy of the General Storm Water Permit for Construction Activity on the same web page that this template was obtained (<https://deg.utah.gov/water-quality/general-construction-storm-water-updes-permits>)

Owner

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name:

Title:

Signature:

Date:

General Contractor

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name:

Title:

Signature:

Date:

SECTION 11: SWPPP PREPARER CERTIFICATION

Instructions:

- Starting January 1, 2021: A SWPPP writer for a site greater than 5 acres, with a perennial surface water within 50 feet of the project, or with a steep slope (70% or 35 degrees or more) must hold a certification to demonstrate that they are a “qualified person” per CGP Part 7.2..

SWPPP Preparer

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name:

Title:

Signature:

Date:

SWPPP APPENDICES

Attach the following documentation to the SWPPP:

Appendix A – Site Maps

Appendix B – NOI

Appendix C – Inspection Reports

Appendix D – Corrective Action Report

***Appendix E – Subcontractor
Certifications/Agreements/Delegation of
Authority (see CGP 9.16(1)b.)***

Appendix F – Training Logs and Certifications (see CGP 6)

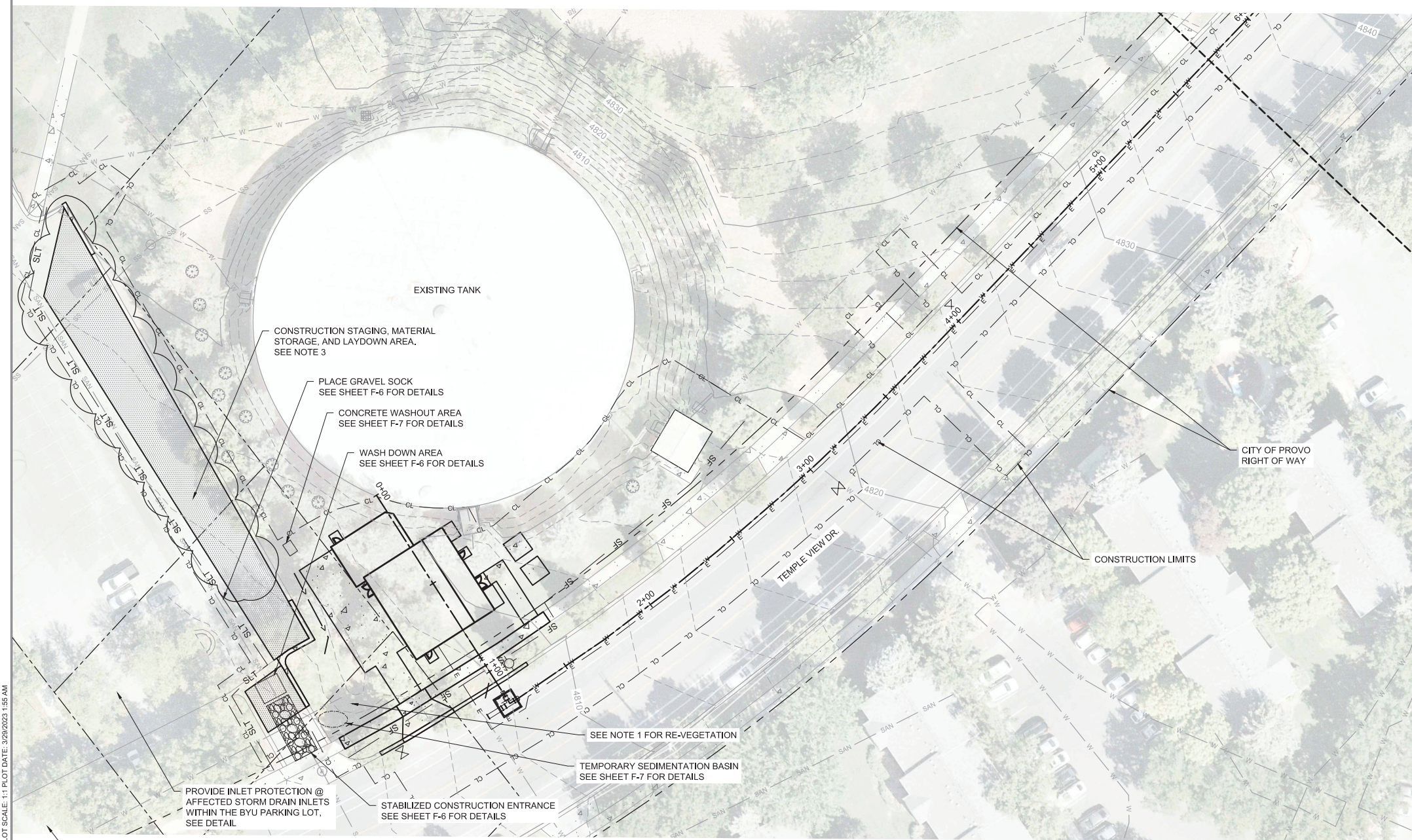
***Appendix G – Additional Information (i.e., Other permits such as
dewatering, stream alteration, wetland; and out of
date swppp documents)***

Appendix H – BMP Instruction and Detail Specifications

Appendix I – Construction General Permit

Appendix A: Site Maps

Include any site maps in this appendix. For site map requirements review SWPPP section 2.5.



LEGEND

— CL —	CONSTRUCTION LIMITS
- - - - -	PROPERTY BOUNDARY
— 5280 —	EXISTING 10-FOOT CONTOUR
- - - - -	EXISTING 2-FOOT CONTOUR
— W — W —	EXISTING CULINARY
— SF —	TEMPORARY SILT FENCE
====>	EXISTING CONCRETE DRAINAGE DITCH
— < —	EXISTING DRAINAGE DITCH
▭	EXISTING BITUMINOUS PAVEMENT
— W — W —	PROPOSED TRANSMISSION LINE
⊙	PROPOSED HYDRANT
⊕	PROPOSED BUTTERFLY VALVE
⊗	PROPOSED GATE VALVE

- SWPPP NOTES:**
- LIMIT LAND CLEARING AND RE-VEGETATE ALL DISTURBED AREAS AS SOON AS POSSIBLE FOLLOWING COMPLETION OF CONSTRUCTION DISTURBANCES. COORDINATE RE-VEGETATION WITH BYU FACILITIES MANAGEMENT.
 - STREET TO BE KEPT CLEAN AND FREE FROM DEBRIS DURING BOOSTER STATION SITE CONSTRUCTION. CONTRACTOR SHALL SWEEP AS REQUIRED.
 - CONSTRUCTION STAGING AREA SHALL HAVE PORTABLE TOILETS AND DUMPSTER ON SITE AND ACCESSIBLE DURING WORKING HOURS.

EXISTING TANK

CONSTRUCTION STAGING, MATERIAL STORAGE, AND LAYDOWN AREA, SEE NOTE 3

PLACE GRAVEL SOCK SEE SHEET F-6 FOR DETAILS

CONCRETE WASHOUT AREA SEE SHEET F-7 FOR DETAILS

WASH DOWN AREA SEE SHEET F-6 FOR DETAILS

SEE NOTE 1 FOR RE-VEGETATION

TEMPORARY SEDIMENTATION BASIN SEE SHEET F-7 FOR DETAILS

STABILIZED CONSTRUCTION ENTRANCE SEE SHEET F-6 FOR DETAILS

PROVIDE INLET PROTECTION @ AFFECTED STORM DRAIN INLETS WITHIN THE BYU PARKING LOT, SEE DETAIL

PROVIDE INLET PROTECTION @ STORM DRAIN INLET AT THE NORTHEAST CORNER OF THE 900 E AND TEMPLE VIEW DR. INTERSECTION, SEE DETAIL

2 PLAN: SWPPP BOOSTER STATION

0 30 60
HORIZONTAL SCALE IN FEET

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ISSUED FOR BID
NOT FOR CONSTRUCTION

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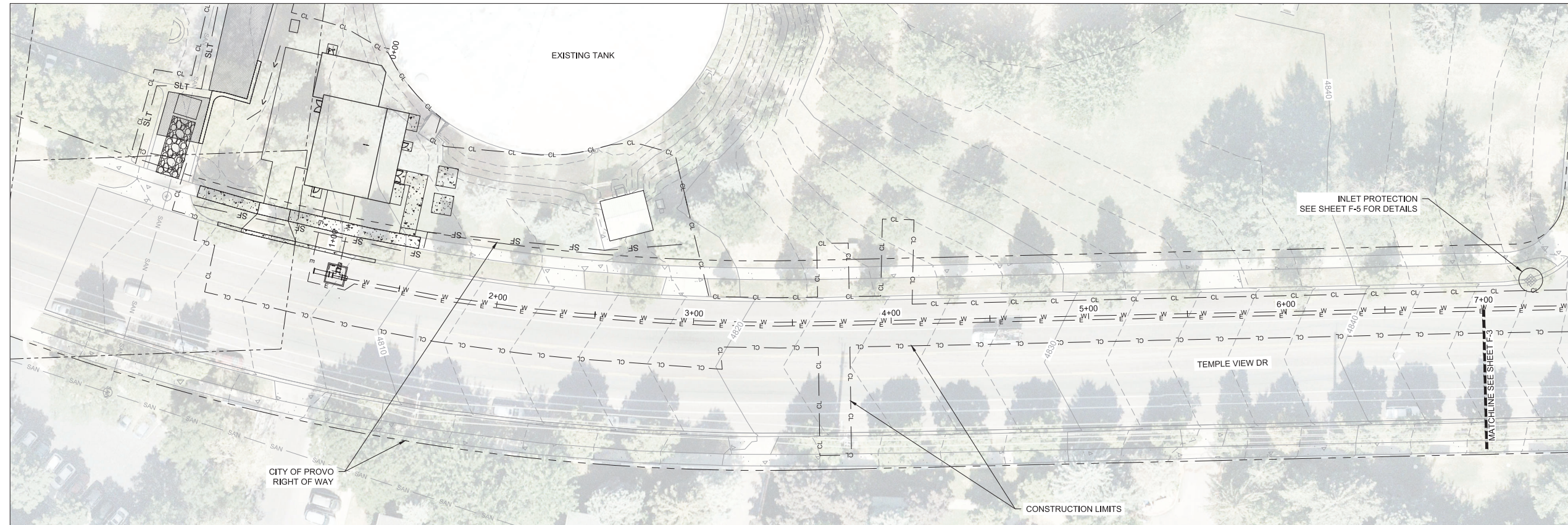
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DATE RELEASED						

BARR	Project Office: BARR ENGINEERING CO. 170 S MAIN ST Suite 500 SALT LAKE CITY, UT 84101
Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277	Ph: 801-833-8400 www.barr.com

Scale	AS SHOWN
Date	10/05/2021
Drawn	AWT
Checked	BDP
Designed	BARR
Approved	MSB2



ROCK CANYON ASR TRANSMISSION LINE PROVO, UTAH	BARR PROJECT No. 44251024.00
SWPPP PLAN BOOSTER STATION	CLIENT PROJECT No. PROVOEN202217308
	DWG. No. F-1
	REV. No. -



1 PLAN: PROPOSED SWPPP (STA 0+00 TO 7+00)

0 30 60
SCALE IN FEET

LEGEND	
— CL —	CONSTRUCTION LIMITS
- - - - -	PROPERTY BOUNDARY
— 5280 —	EXISTING 10-FOOT CONTOUR
- - - - -	EXISTING 2-FOOT CONTOUR
— W — W —	EXISTING CULINARY
— SF —	TEMPORARY SILT FENCE
====<	EXISTING CONCRETE DRAINAGE DITCH
—<	EXISTING DRAINAGE DITCH
▭	EXISTING BITUMINOUS PAVEMENT
— W — W —	PROPOSED TRANSMISSION LINE

ROADWAY SWPPP NOTES:

1. MAINTAIN A 100 FT MAXIMUM ALLOWABLE OPEN TRENCH AND MATERIAL STOCKPILES.
2. STOCKPILE MATERIALS ON IMPERVIOUS SURFACE. INSTALL GRAVEL SOCKS AT THE TOE OF STOCKPILED MATERIAL THAT WILL REMAIN AT THE END OF THE WORKING DAY AND FOR ALL STOCKPILES PRIOR TO PRECIPITATION EVENTS.
3. CONTRACTOR SHALL SWEEP THE WORKING AREA DAILY AND AFTER STOCKPILES ARE MOVED.
4. WATER COMPACTED TRENCHES AS REQUIRED TO MITIGATE DUST MOBILIZATION UNTIL ASPHALT PAVEMENT IS APPLIED.

ISSUED FOR BID
NOT FOR CONSTRUCTION

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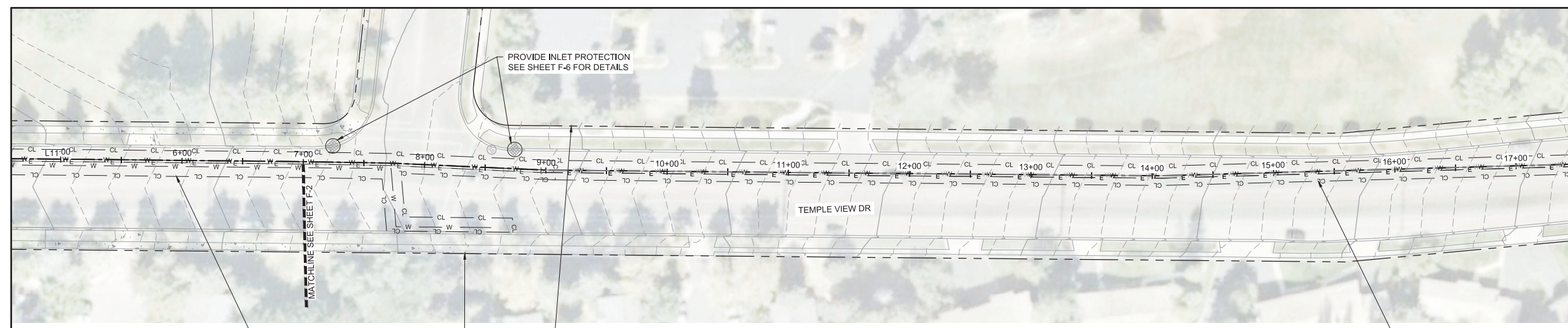
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								Designed BARR								
								Approved MSB2								

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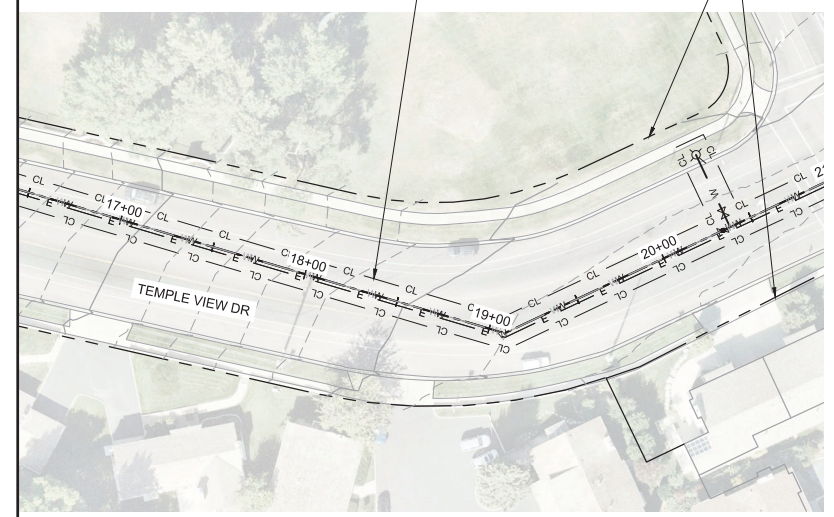
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2. STOCKPILE MATERIALS ON IMPERVIOUS SURFACE. INSTALL GRAVEL SOCKS AT THE TOE OF STOCKPILED MATERIAL THAT WILL REMAIN AT THE END OF THE WORKING DAY AND FOR ALL STOCKPILES PRIOR TO PRECIPITATION EVENTS.
3. CONTRACTOR SHALL SWEEP THE WORKING AREA DAILY AND AFTER STOCKPILES ARE MOVED.
4. WATER COMPACTED TRENCHES AS REQUIRED TO MITIGATE DUST MOBILIZATION UNTIL ASPHALT PAVEMENT IS APPLIED

LEGEND

- CL — CONSTRUCTION LIMITS
- - - - - PROPERTY BOUNDARY
- 5280 — EXISTING 10-FOOT CONTOUR
- - - - - EXISTING 2-FOOT CONTOUR
- w - w - EXISTING CULINARY
- =====
=====
EXISTING CONCRETE DRAINAGE DITCH
- < - - EXISTING DRAINAGE DITCH
- ▭ EXISTING BITUMINOUS PAVEMENT
- w - w - PROPOSED TRANSMISSION LINE
- PROPOSED HYDRANT
- ⊕ PROPOSED BUTTERFLY VALVE
- ⊗ PROPOSED GATE VALVE



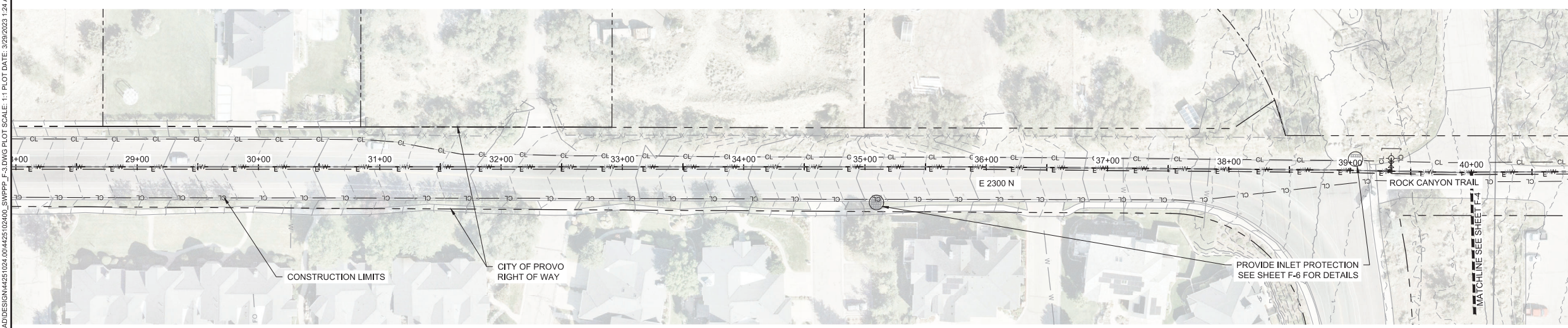
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0 50 100
HORIZONTAL SCALE IN FEET



2 PLAN: SWPPP (STA 17+00 TO 20+50)
0 50 100
HORIZONTAL SCALE IN FEET



3 PLAN: SWPPP (STA 20+50 TO 28+00)
0 50 100
HORIZONTAL SCALE IN FEET



4 PLAN: SWPPP (STA 28+00 TO 40+00)
0 50 100
HORIZONTAL SCALE IN FEET

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NOT FOR CONSTRUCTION

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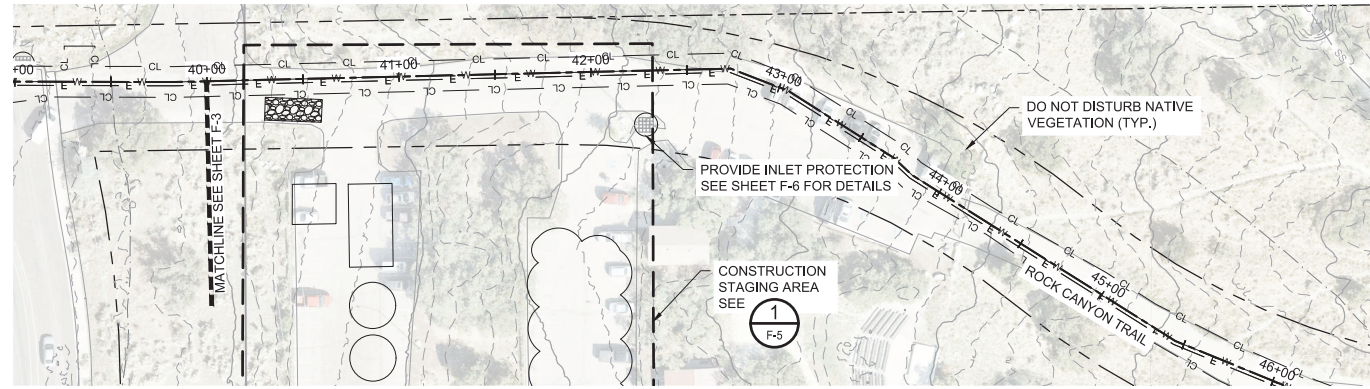
BARR
Project Office:
BARR ENGINEERING CO.
170 S MAIN ST
Suite 500
SALT LAKE CITY, UT 84101
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

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Date	10/05/2021
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Checked	BDP
Designed	BARR
Approved	MSB2



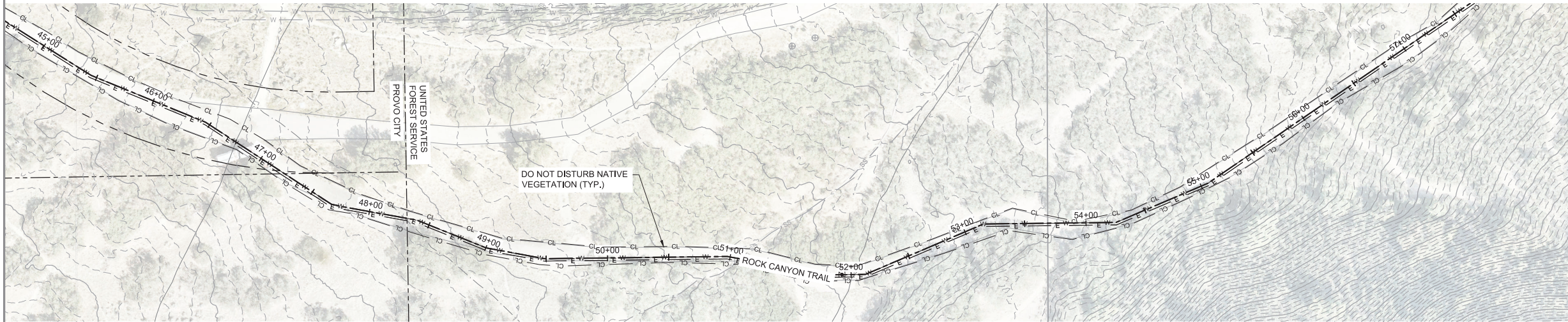
ROCK CANYON ASR TRANSMISSION LINE
PROVO, UTAH
SWPPP PLAN
STA 5+00 TO 40+00

BARR PROJECT No.	44251024.00
CLIENT PROJECT No.	PROVOEN202217308
DWG. No.	F-3
REV. No.	-



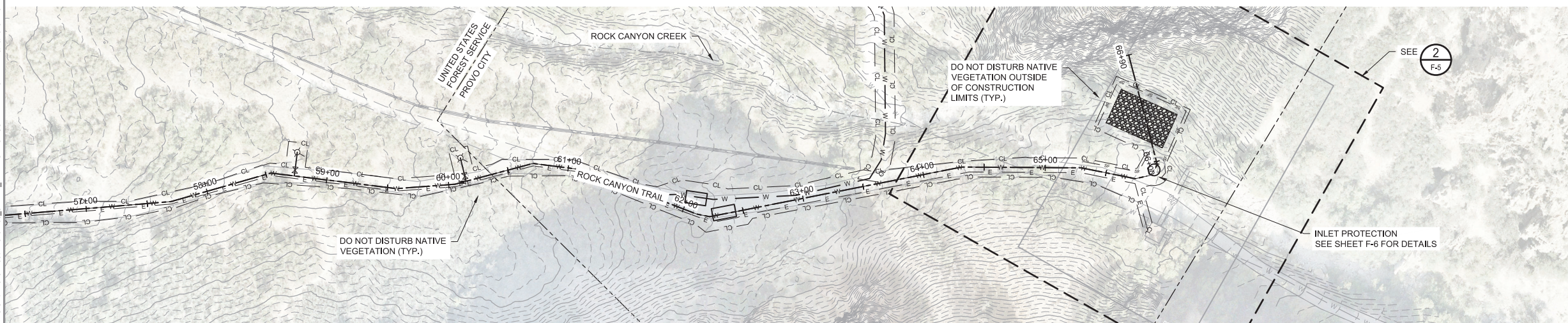
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0 50 100
HORIZONTAL SCALE IN FEET



2 PLAN: SWPPP (STA 45+00 TO 57+00)

0 50 100
HORIZONTAL SCALE IN FEET



3 PLAN: SWPPP (STA 57+00 TO 67+00)

0 50 100
HORIZONTAL SCALE IN FEET

ROCK CANYON SWPPP NOTES:

1. LIMIT LAND CLEARING AND RE-VEGETATE ALL DISTURBED AREAS AS SOON AS POSSIBLE FOLLOWING COMPLETION OF CONSTRUCTION DISTURBANCES.
2. RE-VEGETATE INCIDENTAL CONSTRUCTION DISTURBANCES ACCORDING TO PROJECT DRAWING AND SPECIFICATIONS.
3. STREET TO BE KEPT CLEAN AND FREE FROM DEBRIS DURING ROCK CANYON SITE CONSTRUCTION. CONTRACTOR SHALL SWEEP AS REQUIRED.
4. DURING CONSTRUCTION ACTIVITIES, DO NOT MIX SOIL HORIZONS.
5. DO STOCKPILE TOPSOIL SEPARATELY FROM OTHER SOIL HORIZONS/MATERIALS AND USE DURING RECLAMATION ACTIVITIES ONSITE, (SPREAD OVER TOP OF DISTURBED AREAS NEEDING REVEGETATION, TO IMPROVE PLANT ESTABLISHMENT).
6. IMPORTATION OF TOPSOIL FROM OFF-SITE OR OFF FOREST, (ESPECIALLY IF FROM OFF FOREST) SHOULD NOT BE DONE EXCEPT WHEN ABSOLUTELY NECESSARY AND ONLY WITH PRIOR FOREST SERVICE APPROVAL. IF NEEDED THEN THE SOIL SHOULD BE USED ONLY IF CERTIFIED WEED SEED FREE. PRESERVING AND REPLACEMENT OF EXISTING TOPSOIL (ON SITE) TO RETAIN SOIL PRODUCTIVITY IS PREFERRED.
7. GRAVEL OR BORROW MATERIAL SOURCE SITES WITH NOXIOUS WEED SPECIES PRESENT SHOULD NOT BE USED UNLESS EFFECTIVE TREATMENT OR OTHER MITIGATION MEASURES ARE IMPLEMENTED.
8. LEAVE NATURAL VEGETATION BUFFERS IN PLACE WHEREVER POSSIBLE, (ESPECIALLY AT ANY STREAM OR DRAINAGE CROSSINGS).
9. SPECIAL USE PERMIT HOLDERS REQUIRED TO HAVE A WRITTEN INVASIVE AND NOXIOUS WEED MANAGEMENT PLAN IN PLACE FOR LONG TERM MANAGEMENT OF WEED SPECIES AT PROJECT LOCATION.
10. ALL THE APPLICABLE UINTA NATIONAL 2003 FOREST PLAN (FP) STANDARDS AND GUIDELINES FOR NOXIOUS WEEDS MANAGEMENT WILL BE FOLLOWED.
11. CONSTRUCTION STAGING AREA SHALL HAVE PORTABLE TOILETS AND DUMPSTER ON SITE AND ACCESSIBLE DURING WORKING HOURS.
12. STOCKPILING OF CLEARED AND GRUBBED VEGETATION IS NOT ALLOWED IN ROCK CANYON. CONTRACTOR MUST DISPOSE ACCORDING TO PROJECT SPECIFICATION SECTION XXXX.XX

LEGEND

- CL — CONSTRUCTION LIMITS
- - - - - PROPERTY BOUNDARY
- 5280 — EXISTING 10-FOOT CONTOUR
- - - - - EXISTING 2-FOOT CONTOUR
- W — W — EXISTING CULINARY
- SF — TEMPORARY SILT FENCE
- — — — — EXISTING CONCRETE DRAINAGE DITCH
- < — — — — EXISTING DRAINAGE DITCH
- — — — — EXISTING BITUMINOUS PAVEMENT
- W — W — PROPOSED TRANSMISSION LINE

ISSUED FOR BID
NOT FOR CONSTRUCTION

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CONSTRUCTION RECORD					
PERMIT				03/01/2022	

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Project Office:
BARR ENGINEERING CO.
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www.barr.com

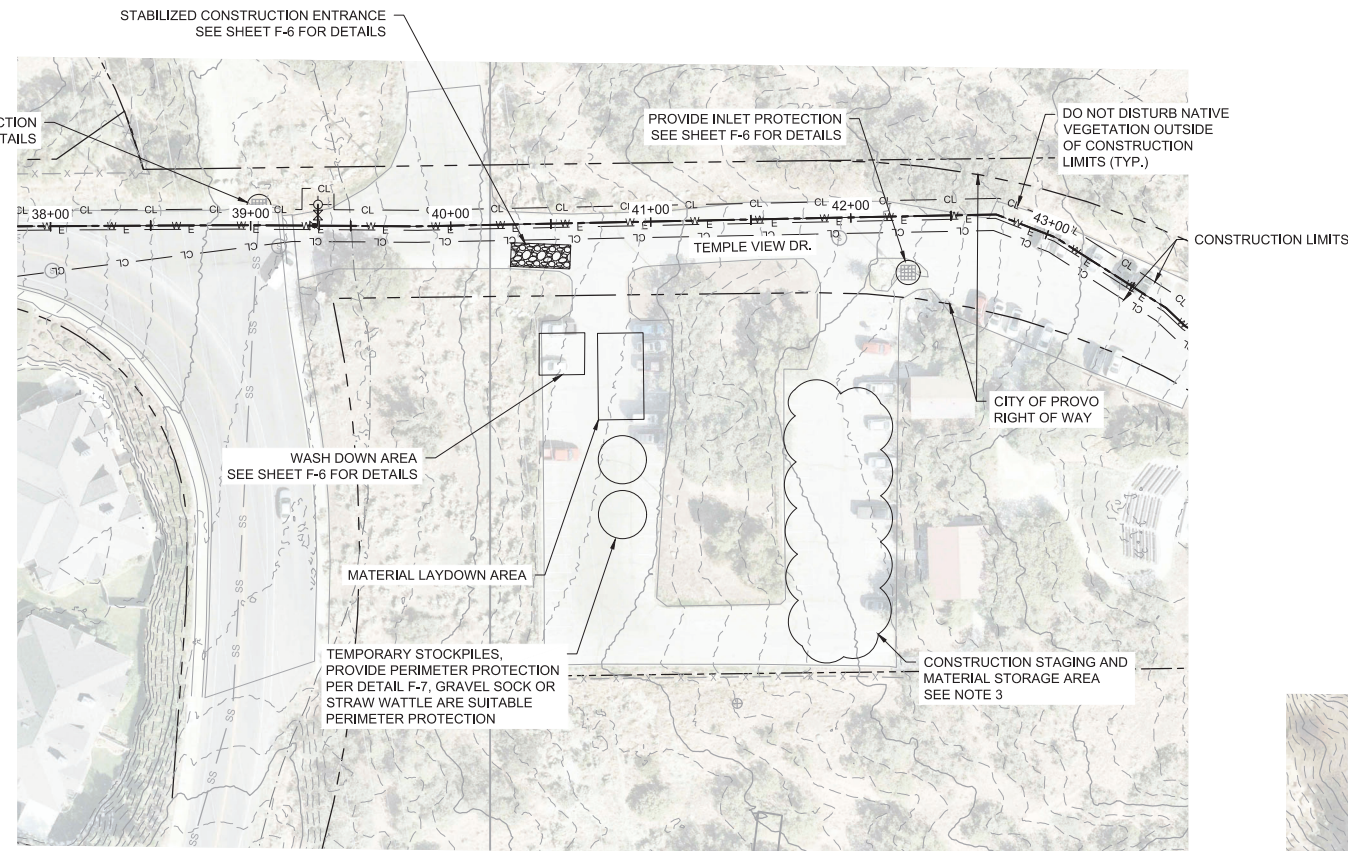
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Designed	BARR
Approved	MSB2



ROCK CANYON ASR TRANSMISSION LINE
PROVO, UTAH

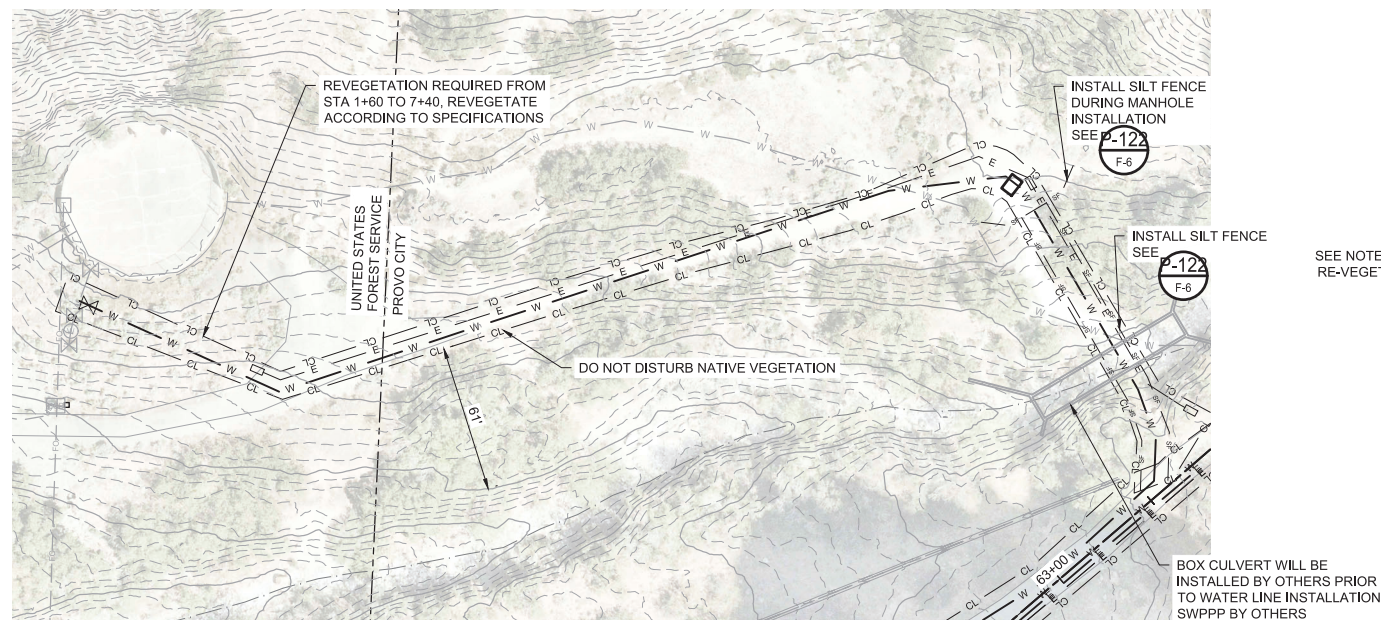
SWPPP PLAN
STA 40+00 TO 67+00

BARR PROJECT No.	44251024.00
CLIENT PROJECT No.	PROVOEN202217308
DWG. No.	F-4
REV. No.	-



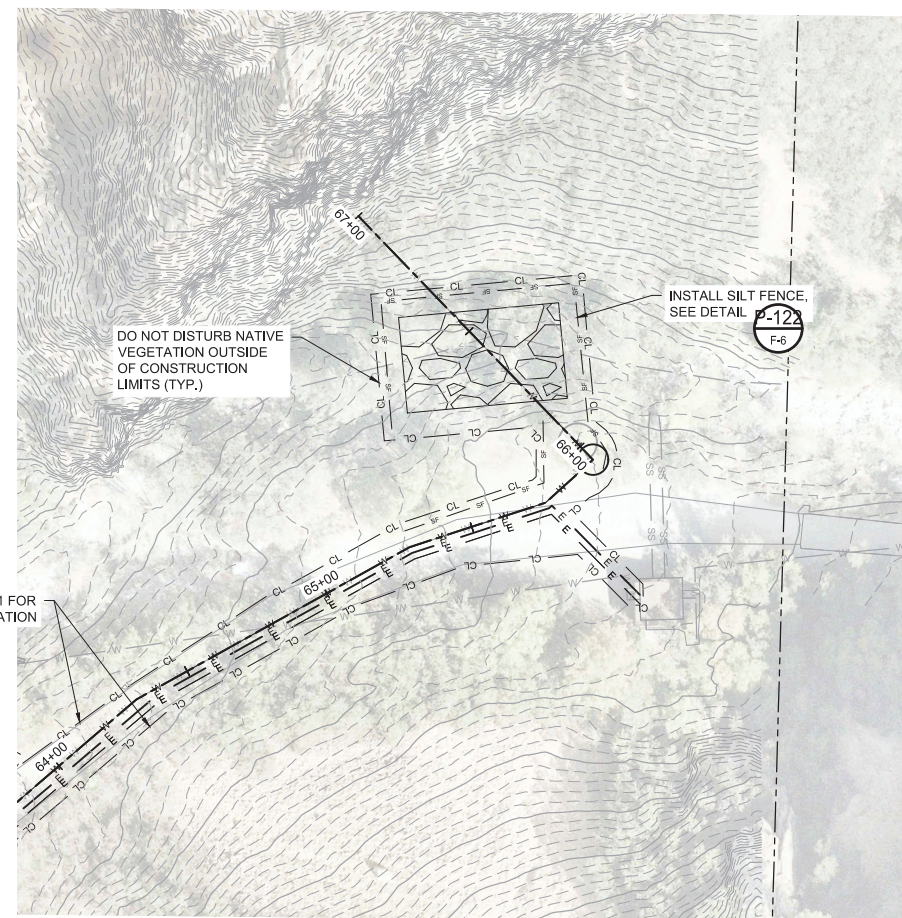
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0 30 60
HORIZONTAL SCALE IN FEET



3 PLAN: TANK FILL LINE

0 40 80
SCALE IN FEET



2 PLAN: SWPPP ROCK CANYON ASR DISCHARGE

0 30 60
HORIZONTAL SCALE IN FEET

LEGEND

CL	CONSTRUCTION LIMITS
---	PROPERTY BOUNDARY
5280	EXISTING 10-FOOT CONTOUR
---	EXISTING 2-FOOT CONTOUR
W W	EXISTING CULINARY
SF	TEMPORARY SILT FENCE
====	EXISTING CONCRETE DRAINAGE DITCH
<	EXISTING DRAINAGE DITCH
▭	EXISTING BITUMINOUS PAVEMENT
W W	PROPOSED TRANSMISSION LINE
⊙	PROPOSED HYDRANT
⊕	PROPOSED BUTTERFLY VALVE
⊗	PROPOSED GATE VALVE

SWPPP NOTES:

- LIMIT LAND CLEARING AND RE-VEGETATE ALL DISTURBED AREAS AS SOON AS POSSIBLE FOLLOWING COMPLETION OF CONSTRUCTION DISTURBANCES.
- STREET TO BE KEPT CLEAN AND FREE FROM DEBRIS DURING BOOSTER STATION SITE CONSTRUCTION. CONTRACTOR SHALL SWEEP AS REQUIRED.
- CONSTRUCTION STAGING AREA SHALL HAVE PORTABLE TOILETS AND DUMPSTER ON SITE AND ACCESSIBLE DURING WORKING HOURS.

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CONSTRUCTION						
RECORD						
PERMIT					03/01/2022	
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DATE RELEASED						

BARR

Project Office:
BARR ENGINEERING CO.
170 S MAIN ST
Suite 500
SALT LAKE CITY, UT 84101

Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-833-8400
www.barr.com

Scale	AS SHOWN
Date	10/05/2021
Drawn	AWT
Checked	BDP
Designed	BARR
Approved	MSB2

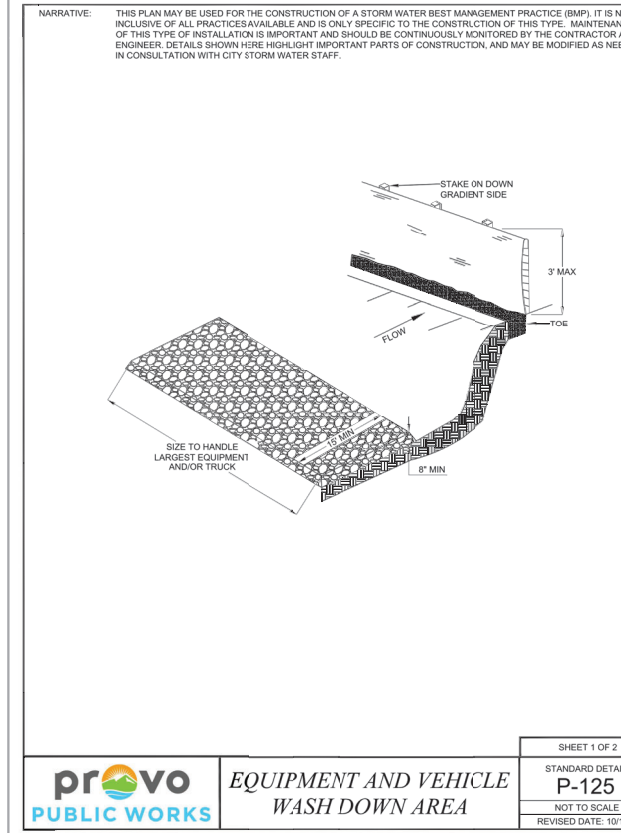
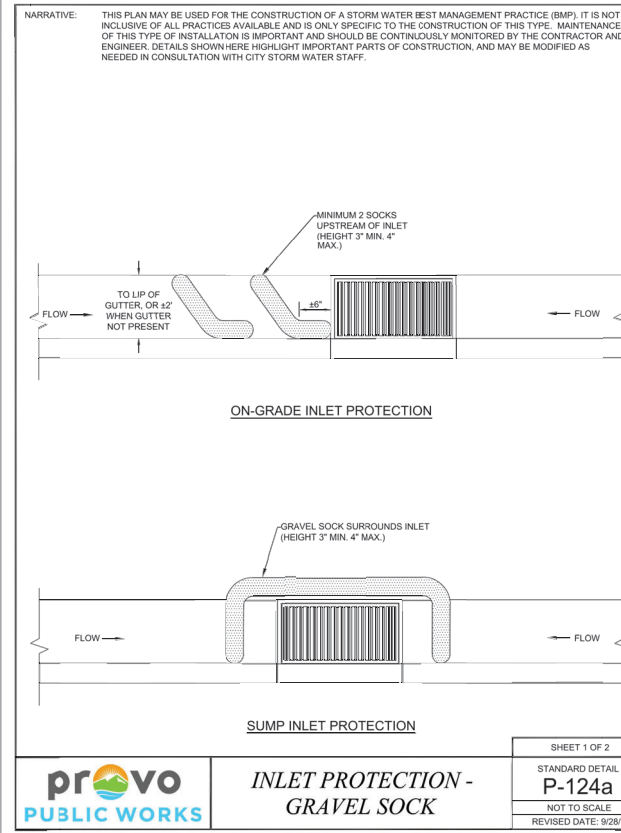
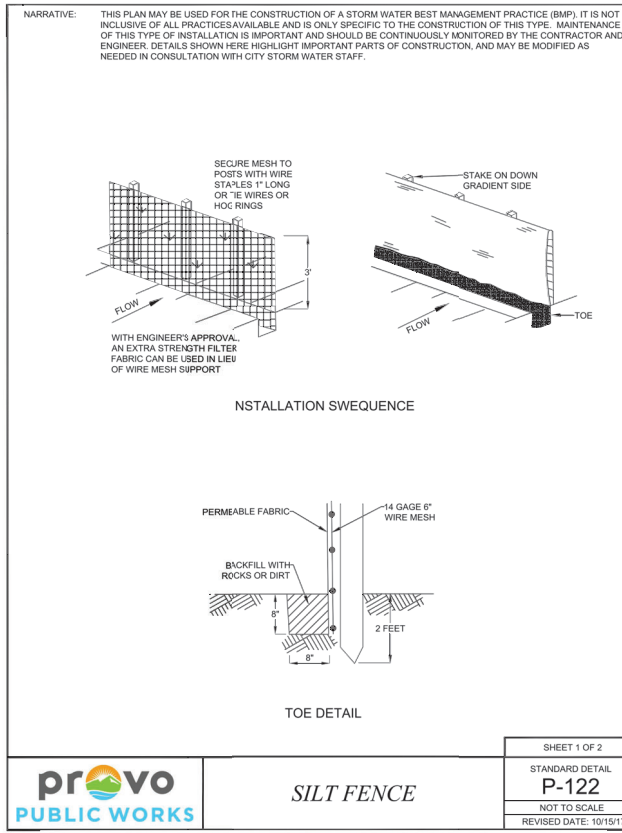
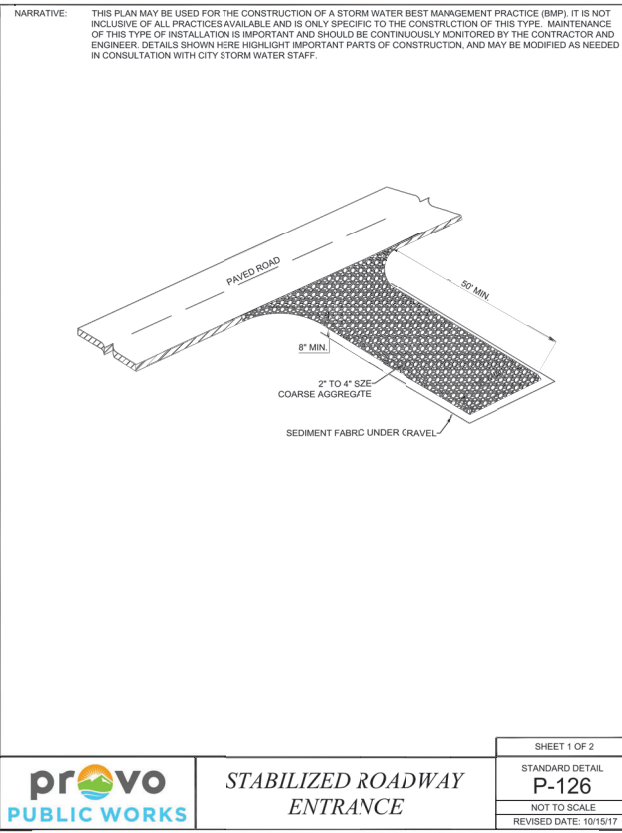


ROCK CANYON ASR TRANSMISSION LINE
PROVO, UTAH

SWPPP PLAN
ROCK CANYON ENTRANCE & ASR DISCHARGE & TANK FILL LINE

BARR PROJECT No.	44251024.00
CLIENT PROJECT No.	PROVOEN202217308
DWG. No.	F-5
REV. No.	-

ISSUED FOR BID
NOT FOR CONSTRUCTION



provo PUBLIC WORKS **STABILIZED ROADWAY ENTRANCE** SHEET 1 OF 2
STANDARD DETAIL **P-126**
NOT TO SCALE
REVISED DATE: 10/15/17

provo PUBLIC WORKS **SILT FENCE** SHEET 1 OF 2
STANDARD DETAIL **P-122**
NOT TO SCALE
REVISED DATE: 10/15/17

provo PUBLIC WORKS **INLET PROTECTION - GRAVEL SOCK** SHEET 1 OF 2
STANDARD DETAIL **P-124a**
NOT TO SCALE
REVISED DATE: 9/28/17

provo PUBLIC WORKS **EQUIPMENT AND VEHICLE WASH DOWN AREA** SHEET 1 OF 2
STANDARD DETAIL **P-125**
NOT TO SCALE
REVISED DATE: 10/15/17

provo PUBLIC WORKS **STABILIZED ROADWAY ENTRANCE** SHEET 2 OF 2
STANDARD DETAIL **P-126**
NOT TO SCALE
REVISED DATE: 10/15/17

1. GENERAL
A. Description. A temporary stabilized pad of gravel for controlling equipment and construction vehicle access to the site.
B. Application. At any site where vehicles and equipment enter the public right of way.

2. PRODUCT (Not used)

3. EXECUTION
A. Clear and grub area, and grade down to provide maximum slope of 1 percent away from paved roadway.
B. Compact subgrade.
C. Place filter fabric under gravel pad consisting of 2-4" coarse aggregate (no fines). Gravel pad shall be a minimum of 8" thick.
D. Maintenance:
D.1. Prevent tracking or flow of mud into the public right-of-way.
D.2. Inspect daily for loss of gravel or sediment build-up.
D.3. Top dressing additional stone or removing, cleaning, and replacing the stone will be required when accumulated mud or sediment impedes the effectiveness of the wash down area.
D.4. Inspect adjacent roadway for sediment deposit and implement additional controls as necessary (such as street sweeping), to keep the public roadway free of accumulated sediment and debris.
D.5. Expand stabilized area as required to accommodate activities.

provo PUBLIC WORKS **SILT FENCE** SHEET 2 OF 2
STANDARD DETAIL **P-122**
NOT TO SCALE
REVISED DATE: 10/15/17

1. GENERAL
A. Description. A temporary sediment barrier consisting of an entrenched, permeable filter fabric stretched across and attached to supporting posts.
B. Application. To intercept sediment from disturbed areas of limited extent.
B.1. Perimeter Control: Place barrier at down gradient limits of disturbed area.
B.2. Sediment Barrier: Place barrier at toe of slope or soil stockpile.
B.3. Protection of Existing Waterways: Place barrier at top of stream bank. Do not place silt fence within stream banks.
B.4. Inlet Protection: see Provo City Plan P-124.3.

2. PRODUCT
A. Fabric. Synthetic filter fabric shall be a permeable sheet of polypropylene, nylon, polyester, or polyethylene yarn. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected use/construction life at a temperature range of 0 deg F to 120 deg F.
B. Burlap. 10 ounces per square yard of fabric.
C. Posts. At least 2"x2" wood, or 1.33 pounds per linear foot steel with a minimum length of 5 feet, or steel posts with projections for fastening wire to them.

3. EXECUTION
A. See attached plan for sequencing. Install wire mesh first.
B. Secure the fabric toe in a minimum 8"x8" trench.
C. When attaching two silt fences together, place the end of post of the second fence inside the end post of the first fence. Rotate both posts at least 180 degrees to create a tight seal with the filter fabric. Drive both posts into the ground and bury the flap in the trench.
D. When used to control sediments from a steep slope, place silt fences away from the toe of the slope for increased holding capacity. A minimum of 5 feet from the slope is required where feasible.
E. Maintenance:
E.1. Inspect silt fence barrier after every storm event, at a minimum twice monthly, and with every SWPPP inspection required by the UPDES permit (if applicable). During prolonged rainfall, inspect daily.
E.2. Should be fabric on a silt fence decompose or become ineffective while a barrier is still necessary replace the fabric promptly.
E.3. Remove sediment deposits when the level of deposition reaches 1/2 the height of the fence, or when deposition deforms the fence and hinders its ability to provide adequate protection.
E.4. Re-anchor fence as necessary to prevent shortcutting.
E.5. Inspect for runoff bypassing ends or undercutting barriers.

provo PUBLIC WORKS **INLET PROTECTION - GRAVEL SOCK** SHEET 2 OF 2
STANDARD DETAIL **P-124a**
NOT TO SCALE
REVISED DATE: 9/28/17

1. GENERAL
A. Description. Placement of gravel sock upstream of curb inlets to filter water runoff.
B. Application. Used at inlets in paved or unpaved areas where up gradient area is to be disturbed by construction activities.

2. PRODUCT (Not used)

3. EXECUTION
A. Provide inlet protection, except when blocking the inlet would cause excessive flooding or undesirable results. Notify Provo City storm water staff immediately for concurrence if inlet protection is to be removed.
B. Prepare gravel sock for other media approved by City storm water staff) in accordance with the manufacturers recommendation.
C. On-grade inlet protection:
C.1. Install at least two (2) gravel socks upstream of the inlet, as shown on the attached plan.
C.2. Gravel sock shall butt tightly against the face of the curb, with 48" of the sock against the curb to ensure a tight fit. The remainder of the sock is placed at an angle away from the curb to trap runoff between the sock and the curb.
C.3. The sock should be 3-4" high, allowing excessive flows to flow either around or over the sock prior to overtopping the curb.
D. Sump inlet protection:
D.1. Install sock around the entire perimeter of the inlet, leaving a min. 3" between the grate and sock.
D.2. Gravel sock shall butt tightly against the face of the curb on both sides of the inlet.
D.3. The sock should be 3-4" high, allowing excessive flows to flow over the sock prior to overtopping the curb.
E. Maintenance:
E.1. Inspect inlet protection after every large storm event, at a minimum twice monthly, and with every SWPPP inspection required by the UPDES permit (if applicable).
E.2. Remove sediment accumulated when it reaches 2-inches in depth.
E.3. Replace media and/or sock when damage has occurred or when it has stopped functioning as intended.
E.4. Expect minor ponding after rain between maintenance. If ponding is deeper than 2-inches, either sediment has accumulated and needs to be removed, or the media and/or sock is plugged and needs to be replaced.

provo PUBLIC WORKS **EQUIPMENT AND VEHICLE WASH DOWN AREA** SHEET 2 OF 2
STANDARD DETAIL **P-125**
NOT TO SCALE
REVISED DATE: 10/15/17

1. GENERAL
A. Description. A temporary stabilized pad of gravel for general washing of equipment and construction vehicles. Intended solely for sediment control. Cannot be utilized for washing equipment or vehicles that may cause contamination of runoff (such as fertilizer equipment or concrete equipment).
B. Application. At any site where regular washing of vehicles and equipment will occur. May also be used as a filling point for water trucks, limiting erosion caused by overflow or spillage of water.

2. PRODUCT (Not used)

3. EXECUTION
A. Wash down areas for vehicles should be located as close as possible to the stabilized construction entrance, to minimize picking up dirt and mud after the vehicle has been washed down.
B. Clear and grub area, and grade down to provide maximum slope of 1 percent away from paved roadway.
C. Compact subgrade.
D. Place filter fabric under gravel pad consisting of 2-4" coarse aggregate (no fines). Gravel pad shall be a minimum of 8" thick.
E. Gravel pad should be sized for the largest equipment and/or truck used onsite to fit comfortably on the pad. Additional area is recommended to increase percolation and mitigate against excessive standing water.
F. Place silt fence on sides of wash down area (not entrance and exit).
G. Maintenance:
G.1. Inspect daily for loss of gravel or sediment build-up.
G.2. Top dressing additional stone or removing, cleaning, and replacing the stone will be required when accumulated mud or sediment impedes the effectiveness of the wash down area.
G.3. Keep the wash area in a condition which will prevent tracking or flowing of mud onto public rights-of-way.
G.4. Repair any structures used to trap sediments.
G.5. Inspect adjacent area for sediment deposit and install additional controls as necessary.
G.6. Maintain silt fence as outlined in Plan P-22.

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CLIENT	1/24/21	1/27/21	02/11/22	05/09/22			
BID							05/31/22
CONSTRUCTION							
RECORD							
PERMIT							09/01/2022
RELEASED TO/FOR	A	B	C	D	E	F	0
DATE RELEASED							

BARR
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BARR ENGINEERING CO.
170 S MAIN ST
Suite 500
SALT LAKE CITY, UT 84101
Corporate Headquarters:
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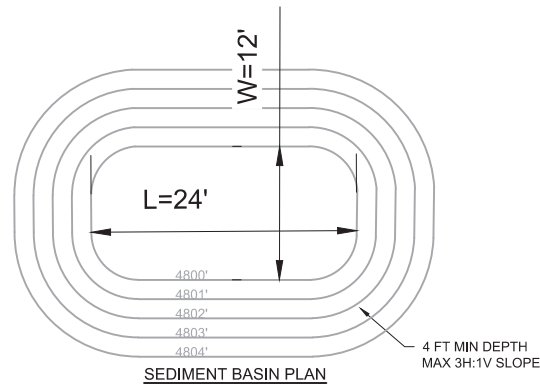
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Drawn	AWT
Checked	BDP
Designed	BARR
Approved	MSB2



ROCK CANYON ASR TRANSMISSION LINE
PROVO, UTAH
SWPPP
CITY OF PROVO DETAILS

BARR PROJECT No. 44251024.00	CLIENT PROJECT No. PROVOEN202217308
DWG. No. F-6	REV. No. -

ISSUED FOR BID
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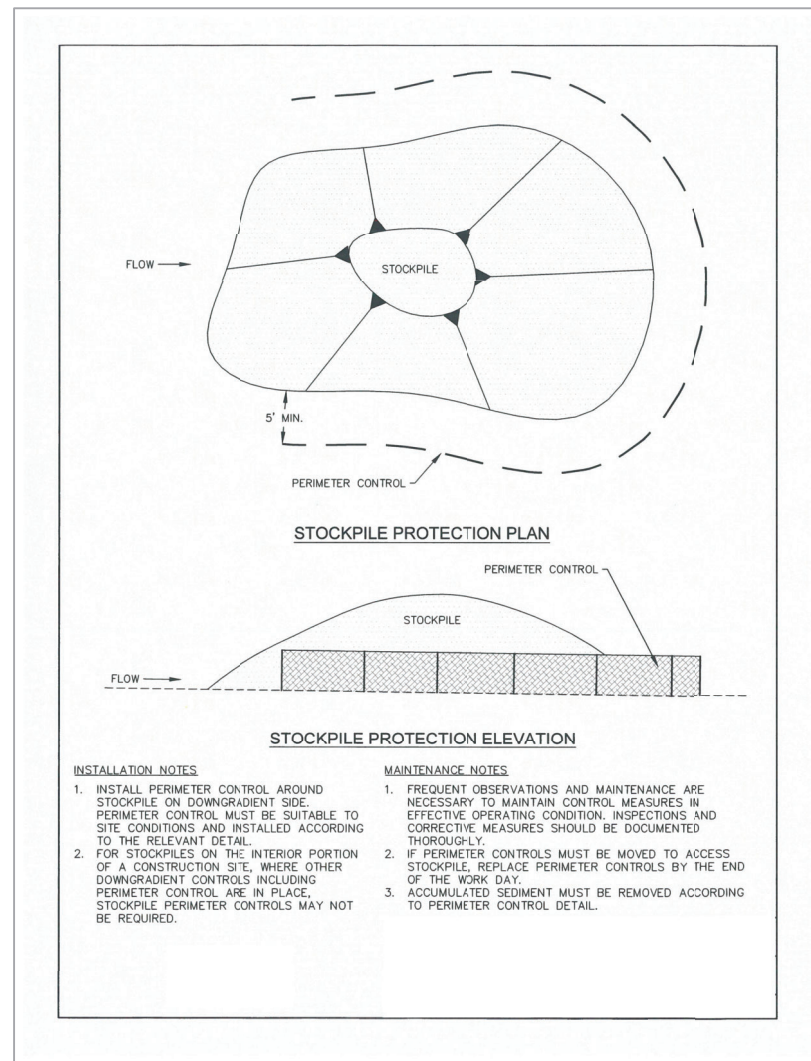


INSTALLATION NOTE:

- FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.

MAINTENANCE NOTES:

- FREQUENT OBSERVATION AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
- SEDIMENT ACCUMULATED IN BASIN SHALL BE REMOVED AS NEEDED TO MAINTAIN CONTROL MEASURE EFFECTIVENESS, TYPICALLY WHEN SEDIMENT DEPTH REACHES ONE FOOT (I.E. TWO FEET BELOW SPILLWAY CREST).
- SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED.
- PERMANENTLY STABILIZE AREA AFTER SEDIMENT BASIN REMOVAL.



INSTALLATION NOTES

- INSTALL PERIMETER CONTROL AROUND STOCKPILE ON DOWNGRADIENT SIDE. PERIMETER CONTROL MUST BE SUITABLE TO SITE CONDITIONS AND INSTALLED ACCORDING TO THE RELEVANT DETAIL.
- FOR STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER DOWNGRADIENT CONTROLS INCLUDING PERIMETER CONTROL ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

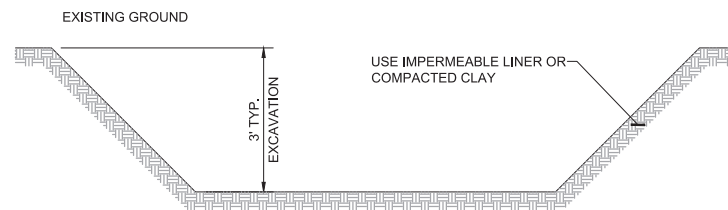
MAINTENANCE NOTES

- FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
- IF PERIMETER CONTROLS MUST BE MOVED TO ACCESS STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORK DAY.
- ACCUMULATED SEDIMENT MUST BE REMOVED ACCORDING TO PERIMETER CONTROL DETAIL.

TEMPORARY BMP NOTES:

- INSTALL BMPS PER PROVO CITY AND APWA STANDARDS.
- SWPPP STATIONING IS EQUIVALENT TO TRANSMISSION LINE STATIONING.
- CONTRACTOR TO VERIFY UTILITY DEPTHS OF ANY POTENTIAL CONFLICTS WITH LAND DISTURBANCE ACTIVITIES AND TEMPORARY BMP INSTALLATION.
- TOTAL DISTURBED AREA FOR PROJECT = 3.1 ACRES.
- ALL EROSION CONTROL BEST MANAGEMENT PRACTICES SHALL BE INSPECTED AND MAINTAINED REGULARLY AND AFTER EVERY STORM EVENT IN ACCORDANCE WITH SWPPP PERMIT REQUIREMENTS.
- LAND DISTURBANCE SHALL BE KEPT TO MINIMUM TO CONTROL RUNOFF FROM THE CONSTRUCTION AREA.
- AT ALL TIMES DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MITIGATING EROSION DUE TO WIND AND PRECIPITATION.
- CONTRACTOR SHALL PROVIDE DUST CONTROL MEASURES AT ALL TIMES DURING CONSTRUCTION.
- PORTABLE TOILET TO BE ACCESSIBLE WITHIN ACTIVE CONSTRUCTION AREA AT ALL TIMES. MEET OSHA MINIMUM REQUIREMENTS FOR ACCESS.
- A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN SHALL BE KEPT WITHIN THE CONSTRUCTION AREA DURING ALL CONSTRUCTION ACTIVITY.

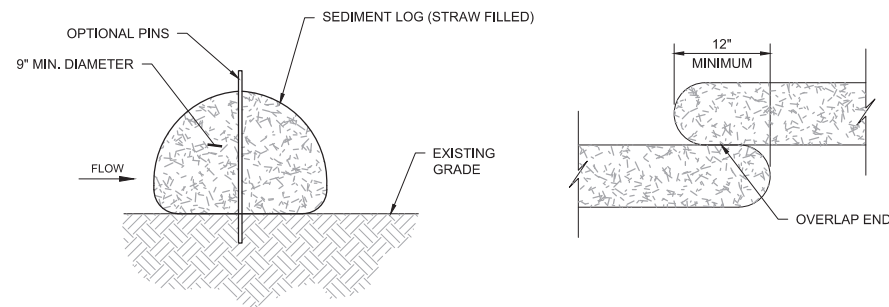
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NOTES:

- WASHOUT SHALL BE INSPECTED AS NEEDED
- WASHOUT USE SHALL FOLLOW ALL SWPPP REQUIREMENTS
- PLAN DIMENSIONS: SIZED FOR WORK ACTIVITIES
- MANAGEMENT AND DISCHARGE OF CONCRETE WASHOUT SHALL BE IN ACCORDANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE WORK
- CONCRETE PITS MUST BE BERMED TO PREVENT RUN-IN OF STORMWATER

DETAIL: CONCRETE WASHOUT AREA
NOT TO SCALE



NOTES:

- STAKE FREE SEDIMENT LOG TO BE USED IN AREAS THAT ARE RELATIVELY FLAT AND SHOULD BE INSTALLED ALONG CONTOURS (CONSTANT ELEVATION).
- NO GAPS SHALL BE PRESENT UNDER SEDIMENT LOG. PREPARE AREA AS NEEDED TO SMOOTH SURFACE OR REMOVE DEBRIS.
- ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN REACHING 1/2 OF LOG HEIGHT.
- SEDIMENT LOG SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIRED OR REPLACED AS REQUIRED.

DETAIL: STRAW WATTLE - STAKE FREE
NOT TO SCALE

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CLIENT	1/24/21	1/27/21	02/11/22	05/09/22			
BID							
CONSTRUCTION							
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DATE RELEASED							

Project Office:
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Corporate Headquarters:
 Minneapolis, Minnesota
 Ph: 1-800-632-2277

Scale	AS SHOWN
Date	10/05/2021
Drawn	AWT
Checked	BDP
Designed	BARR
Approved	MSB2



ROCK CANYON ASR TRANSMISSION LINE
 PROVO, UTAH

SWPPP
 APWA DETAILS

BARR PROJECT No.	44251024.00
CLIENT PROJECT No.	PROVOEN202217308
DWG. No.	F-7
REV. No.	-

ISSUED FOR BID
NOT FOR CONSTRUCTION

Appendix B: NOI

Include a copy of your NOI in this appendix. The NOI must be signed.

Appendix C: Inspection Reports

Place all completed inspection reports in this appendix. You may also put blank inspection reports here to be completed.

You are encouraged to create your own inspection forms for each site. Inspection reports must have the following information:

- 1) The inspection date.
- 2) The UPDES ID number (UTRXXXXX).
- 3) Name and title of personnel making the inspections.
- 4) Summary of inspection findings and any necessary corrective actions:
 - a. Are storm water controls properly installed and operational? If failed then why?
 - b. Presence of any conditions that could lead to spills or leaks.
 - c. Locations where new or modified controls are necessary.
 - d. Signs of visible erosion or sediment depositing related to your discharges.
 - e. Any incidents of noncompliance.
 - f. Visual quality of any discharges occurring.
- 5) Rainfall amount if the inspection was triggered by a precipitation event.
- 6) If it was unsafe to inspect any areas of the site, a description of the area and reason.

Appendix D: Corrective Action Report

An example corrective action report has been included in this appendix. Review SWPPP section 8.2 for corrective action requirements. You can also create your own form or include corrective actions on your inspection form.

Appendix D –Corrective Action Report

Inspection Date	Inspector Name(s)	Description of BMP Deficiency	Corrective Action Needed (including planned date/responsible person)	Date Action Taken/Responsible person

Appendix E: Subcontractor Certifications/Agreements/Delegation of Authority (CGP 9.16.(1)b.)

A sample subcontractor agreement form and delegation of authority form have been included in this appendix. If these are used, keep complete signed forms here.

SUBCONTRACTOR CERTIFICATION
STORM WATER POLLUTION PREVENTION PLAN

Project Number: _____

Project Title: _____

Operator(s): _____

As a subcontractor, you are required to comply with the Storm water Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at request.

Each subcontractor engaged in activities at the construction site that could impact storm water must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the BMPs and practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

Signature: _____

Title: _____

Date: _____

Delegation of Authority

I, _____, hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the UPDES “General Permit for Storm Water Discharges Associated with Construction Activity” (CGP), at the construction site:

_____, Permit No. UTR _____

The designee is authorized to sign all reports required by the Permit and other information requested by the Director of the Utah Division of Water Quality, or by an authorized representative of the Executive Secretary.

Name of Person or Position: _____

Owner/Operator: _____

Mailing Address: _____

City, State, Zip Code: _____

Phone Number: _____

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in Part 9.16 of the CGP, and that the designee above meets the definition of a “duly authorized representative” as set forth in Part 9.16.b. of the CGP.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____

Title: _____

Signature: _____

Date: _____

Appendix F: Training Logs and Certifications (see CGP 6)

A sample training log has been included in this appendix to keep track of trainings that have been provided. At a minimum, storm water team members that require training should be provided with the following if it relates to their duties (CGP Part 6.3.):

- The permit deadlines associated with installation, maintenance, and removal of storm water controls and with stabilization;
- The location of all storm water controls on the site required by this permit and how they are to be maintained;
- The proper procedures to follow with respect to the permit's pollution prevention requirements; and
- When and how to conduct inspections, record applicable findings, and take corrective actions

Certifications for SWPPP inspectors or writers can also be placed in this appendix.

Appendix F –SWPPP Training Log

Storm Water Pollution Prevention Training Log

Project Name:

Project Location:

Instructor's Name(s):

Instructor's Title(s):

Course Location: _____ Date: _____

Course Length (hours): _____

Storm Water Training Topic: *(check as appropriate)*

- Erosion Control BMPs
- Emergency Procedures
- Sediment Control BMPs
- Good Housekeeping BMPs
- Non-Storm Water BMPs

Specific Training Objective: _____

Attendee Roster: *(attach additional pages as necessary)*

No.	Name of Attendee	Company
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Appendix G: Additional Information

Use this appendix for additional information such as other permits (dewatering, stream alteration, etc.) or out of date SWPPP documents.

Appendix H: BMP Instruction and Detail Specifications

Use this appendix if complete BMP specifications are not provided in Section 5 or 6 of the SWPPP.

Appendix I: Construction General Permit

If all storm water team members access the CGP via the internet while on site the following link to access the Construction General Permit is sufficient:

<http://construction.stormwater.utah.gov>

Otherwise, include a printed out copy of the Construction General Permit in this appendix.

SECTION 01 55 23S SAFETY

Add this Supplemental Specification to the Contract Documents.

PART 1 GENERAL

1.1 SUMMARY

- A. This Section outlines safety requirements necessary for completion of the Work.

1.2 HEALTH AND SAFETY REQUIREMENTS

- A. CONTRACTOR shall be solely and completely responsible for job-site conditions and safety procedures and programs on the Site, including safety of all persons and property during performance of the Work. This requirement will apply continuously and not be limited to normal working hours. Observation of the Work by OWNER or ENGINEER is not intended to include review of the adequacy of CONTRACTOR's safety procedures and programs on or near the Site.
- B. Comply with all relevant OSHA standards.
- C. Comply with all relevant government orders regarding the COVID-19 pandemic.
- D. Implement and enforce health and safety requirements and take necessary precautions and provide protection for the following:
 - 1. Personnel working on or visiting Site, irrespective of employer.
 - 2. Work and materials or equipment to be incorporated in Work area (on-site or off-site).
 - 3. Other property at or adjacent to Site.
 - 4. Public exposed to job-related operations or potential release of toxic or hazardous materials.
- E. Appoint a responsible person familiar with legislated requirements for construction safety. Responsible person shall be familiar with such safety requirements as well as OWNER's safety requirements and ensure that they are enforced. The responsible person shall have a project site presence.
- F. Inform OWNER immediately of accidents, near misses, and potential hazards and be responsible for giving the required notice of accidents to government authorities as required by law.
- G. CONTRACTOR shall be responsible for general safety and conduct of employees and ensure that:

1. Equipment is operated and maintained only by persons qualified by adequate training and experience.
 2. Employees do not trespass beyond boundaries established for work of this Contract unless required to do so in pursuance of work of this Contract.
 3. All protective personnel safety equipment is worn or used in keeping with the hazards of work being carried out and as required by OWNER.
 4. Ensure employees are familiar with safety rules and regulations on the site.
- H. Provide suitable barricades around all excavations, openings and other potentially dangerous areas and remove the barricades when they are no longer necessary.
- I. Provide adequate lighting at all excavations, openings, and other potentially dangerous areas during the hours of darkness.
- J. Remove snow as necessary for safe and adequate performance of the Work.
- K. Provide and use Ground Fault Interrupters (GFI's) in any damp, wet, or any conditions requiring such protection.

1.3 EMERGENCIES

- A. In emergencies affecting the safety or protection of persons, the Work, or any property adjacent to the Work, CONTRACTOR, without special instruction from OWNER or ENGINEER, is obligated to act to prevent threatened damage, injury, or loss. Give ENGINEER prompt written notice if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been created by such emergency. If ENGINEER or OWNER determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to such an emergency, a Change Order will be issued to document the consequences of such action.

1.4 FUEL STORAGE AND SPILLS

- A. CONTRACTOR shall be responsible for safe and proper fuel storage in accordance with the material data sheet, legal requirements, and OWNER requirements.
- B. CONTRACTOR shall be responsible for safe and proper refueling and fuel handling in accordance with the material data sheet, legal requirements, and OWNER requirements.
- C. All spills shall be contained and reported immediately in compliance with the material data sheet, legal requirements, and OWNER requirements.

1.5 BASIS OF COMPENSATION

- A. All costs to comply with the requirements of this Section shall be considered to be included in the Contract Price.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 55 23S

SECTION 01 75 16S STARTING AND ADJUSTING

Delete Standard Specification Section 01 75 16 STARTING AND ADJUSTING in its entirety and replace it with the following.

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Starting systems.
 - 2. Demonstration and instructions.
 - 3. Testing, adjusting, and balancing.
- B. Coordinate and plan the start-up of the individual pieces of equipment and systems and to demonstrate that the entire completed Work meets the requirements of these Contract Documents.

1.2 INITIAL START-UP OF EQUIPMENT

- A. Coordinate the schedule for start-up of individual pieces of equipment with the necessary controls, piping, wiring, and other related Work so that start-up is attempted only after Work has progressed and additional installation or modification will not be required after start-up.
- B. Notify OWNER and ENGINEER two (2) calendar days prior to start-up of each piece of equipment or system.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, control sequence, pressure relief, wiring, operating speed, and any other conditions that may cause damage to the equipment, personnel, or other portions of the Work.
- D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer. Verify that wiring and support components for equipment are complete and tested.
- E. Execute start-up of equipment in accordance with requirements of relevant individual Specification Sections and, in the absence of other instructions, in accordance with manufacturer's instructions. Review manufacturer's instructions prior to start-up and inform ENGINEER of any conflicts or discrepancies with the Contract Documents.
- F. Execute the start-up under the supervision of qualified tradesmen experienced in the installation, operation, and repair of equipment of the type being started.

1.3 DEMONSTRATION TESTING AND OPERATION

- A. In addition to the tests required in the individual Specification Sections, conduct a test or tests as necessary to demonstrate that the individual systems or pieces of equipment function together as a whole to meet the design concept.
- B. Furnish all labor, equipment, and materials necessary for demonstration testing, initial setting and balancing, debugging, and other operations needed to make the entire system operational for its intended use. Personnel shall be experienced tradesmen familiar with the equipment and its installation, operation, and repair.
- C. Complete all demonstration testing prior to Substantial Completion. If initial demonstration testing reveals defective Work, correct Work and repeat perform demonstration testing.
- D. All process, mechanical, and electrical equipment, including related control systems, shall be subjected to preliminary operation and demonstration testing by CONTRACTOR before the individual facilities and systems are put into operation. Tests shall be conducted to determine whether the equipment has been properly assembled, aligned, adjusted, wired, or connected. Upon completion of the checking and adjustment, demonstrate that each separate piece of equipment in each system operates in accordance with the requirements of the Contract Documents and that the individual systems operate together as required. Where no specific performance requirements are stated, the demonstration test shall show that the equipment operates in accordance with normal application practice for the equipment. The demonstration test shall show that the equipment and systems:
 - 1. operate smoothly and without excessive noise and vibration,
 - 2. are free from leaks,
 - 3. are responsive to manual and automatic controls,
 - 4. control and protective devices are properly set,
 - 5. will run on a controlled or intermittent basis when either operation is intended, and
 - 6. valves seat fully and provide tight shutoff.The demonstration test for each piece of equipment shall include checkout from each remote-control point. All alarm systems and safety lockout systems shall also be demonstrated for proper function, as well as all process instrumentation and controls.
- E. Schedule the demonstration tests for performance in the presence of OWNER and ENGINEER. OWNER and ENGINEER shall be notified at least 2 calendar days in advance of all tests.
- F. Any equipment placed into temporary operation following its demonstration testing but prior to Substantial Completion shall be adjusted and recalibrated immediately prior to Substantial Completion.

1.4 INSTRUCTION OF OWNER'S EMPLOYEES

- A. Provide competent personnel who fully understand the operation of the equipment to instruct OWNER's employees and ENGINEER in the operation, maintenance, and repair of each item and system. Such instruction shall take place following demonstration and commissioning testing and prior to Substantial Completion and at such a time or times that are acceptable to OWNER and ENGINEER. Training shall be of the on-the-job type and shall cover all areas of operation and maintenance. Training shall, unless otherwise approved, be by factory representatives. OWNER's personnel shall be allowed to video tape the instructions by equipment representatives. Length of training shall be as required to provide complete information to OWNER's personnel to operate the equipment, or as specified in the individual Sections of the Specifications.
- B. At least 2 calendar days prior to training, deliver to OWNER all operating and maintenance instructions required under the Contract Documents.

1.5 SUBSTANTIAL COMPLETION AND SYSTEM START-UP

- A. Following Substantial Completion, the entire Work may be put into service by OWNER. While being operated, OWNER will perform all routine operating procedures such as reading gauges, adjusting valves, and operating controls.

1.6 BASIS FOR COMPENSATION

- A. All costs to comply with the requirements of this Section shall be considered to be included in the Contract Price.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 75 16S

SECTION 01 78 50S CLOSEOUT PROCEDURES

Delete Standard Specification 01 78 50 CLOSEOUT PROCEDURES in its entirety and replace it with the following.

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes procedures for Substantial Completion, final completion (final acceptance), and Project closeout.

1.2 SUBSTANTIAL COMPLETION

- A. The Work shall be considered substantially complete when the Work is available for its intended use and all Build America Buy America Act documentation has been submitted by CONTRACTOR and approved/accepted by OWNER (see 00 45 15 Federal Requirements).

1.3 RECORD DOCUMENTS

- A. Maintain at the Site one set of record documents including all Plans, Specifications, Change Orders, field test records (if applicable), associated permits, redline record plans, and documentation of construction activities as required, in good condition and legibly annotated to show changes made during construction. Store record documents separate from documents used for construction and clearly mark them and make accessible to ENGINEER and OWNER at all times.
- B. Record information on record documents concurrent with construction progress. Make record documents accessible to ENGINEER and OWNER at all times; ENGINEER and OWNER may require CONTRACTOR to improve its performance with regard to recording information during the duration of the Project.
- C. Record for each product listed in the Specifications, a description of the actual products installed, including the following:
 - 1. Manufacturer's name and product model number.
 - 2. Product substitutions or alternates used.
 - 3. Changes made by Change Order.
 - 4. Quality control procedures and test results.

- D. At a minimum, the following items shall be legibly marked on the record plans to record actual construction:
 - 1. Relevant information from approved Shop Plans.
 - 2. Measured depths or elevations of foundations in relation to a clearly defined, reproducible datum.
 - 3. Measured horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements or survey markers.
 - 4. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 5. Changes made by Change Order and all minor field changes of dimension and detail.
 - 6. Details not shown on original Plans.
- E. Do not conceal Work until required information is recorded.
- F. Submit record documents, and all operations and maintenance manuals and other submittals required by Specification Section 01 33 00 Submittal Procedures.

1.4 ONGOING CLEANUP

- A. Keep the Site free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work, remove all waste materials, rubbish, and debris from the premises as well as all tools, construction equipment and machinery, temporary facilities, and surplus materials. Leave the Site clean and ready for occupancy by OWNER.
- B. Prior to final acceptance, provide final cleaning of the Sites, including, but not limited to the roads, sidewalks, structures, and Site improvements, so that the Work will be ready for use by OWNER without further cleaning.

1.5 FINAL INTERIOR CLEANING

- A. Prior to final acceptance, provide cleaning of all surfaces, systems and fixtures, grates and drains, including removal of labels, tags, grease, oil, dirt, dust, and stains.

1.6 FINAL ACCEPTANCE

- A. When CONTRACTOR considers that the Work is complete and ready for final acceptance, provide written notice to ENGINEER.
- B. CONTRACTOR shall certify by written notice to ENGINEER that:
 - 1. Contract Documents have been thoroughly reviewed and Work has been inspected by CONTRACTOR and complies with the Contract Documents.
 - 2. Work is completed and ready for final acceptance.

- C. Upon receipt of such notice, ENGINEER and OWNER will make a final review of the Work with CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this review reveals that the Work is incomplete or defective. CONTRACTOR shall take such measures as are necessary to remedy such deficiencies.
- D. Upon remedy of all such defects and deficiencies noted by ENGINEER and OWNER in part 1.06 C, above, ENGINEER will issue a recommendation for final acceptance to OWNER.

1.7 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, and maintenance materials in quantities specified in each Specification Section, in addition to that required for completion of the Work. Coordinate with ENGINEER and deliver to facility prior to Final Application for Payment.

1.8 GUARANTIES AND WARRANTIES

- A. CONTRACTOR shall guarantee all Work and material against all defects as specified in the General Conditions (and Supplementary Conditions), or as otherwise required for specific items in these Specifications. Warranty requirements noted in individual Specification Sections that exceed the minimum correction period prescribed in the General Conditions shall apply for the stipulated time for both material and labor.
- B. Standard product warranties are defined as preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to OWNER.
- C. Special Warranties are defined as written warranties required by, or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for OWNER.
- D. When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- E. Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. CONTRACTOR is responsible for the cost of replacing or rebuilding defective Work regardless of whether OWNER has benefited from use of the Work through a portion of its anticipated useful service life.
 - 1. Repair or replace any such defective Work to conform to the provisions of the Contract and without expense to Buyer, within 10 working days after notification in writing by Buyer or ENGINEER of such defective Work.
 - 2. If the noted repairs are not made by CONTRACTOR, or it has not made arrangements for the correction thereof within the period specified above, OWNER may do so, and may charge the cost of same to CONTRACTOR.

3. CONTRACTOR shall perform repair Work so as to cause OWNER a minimum of inconvenience and interruption of services.
- F. When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
 - G. Manufacturer's disclaimers and limitations on product warranties do not relieve CONTRACTOR of warranty on the Work that incorporates the products.
 - H. Written warranties made to OWNER are in addition to implied warranties, and shall not limit the duties, obligations, rights, and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which OWNER can enforce such other duties, obligations, rights, or remedies. OWNER reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
 - I. OWNER reserves the right to refuse to accept Project Work where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
 - J. Submit duplicate copies of written warranties to ENGINEER prior to the date certified for Substantial Completion in accordance with the requirements of Specification Section 01 33 00 Submittal Procedures. ENGINEER's certificate of Substantial Completion shall be the commencement date for warranties. When a designated portion of the Work is completed and occupied or used by OWNER, by separate agreement with CONTRACTOR during the construction period, submit properly executed warranties to ENGINEER within 15 days of completion of that designated portion of the Work. For items of Work delayed beyond the date of Substantial Completion, provide updated submittal within ten days of acceptance by OWNER, listing date of acceptance as start of warranty period.
 1. When a special warranty is required to be executed by CONTRACTOR, or CONTRACTOR and a Subcontractor, Supplier, or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to OWNER through ENGINEER for approval prior to final acceptance.
 2. Execute and assemble documents from Subcontractors, Suppliers, and manufacturers.
 3. Refer to individual Specification Sections for specific content requirements, and particular requirements for submittal of special warranties.

1.9 BABA ACT COMPLIANCE DOCUMENTATION

- A. All documentation required to demonstrate compliance with the Build America Buy America Act shall be submitted prior to Substantial Completion.

B. OWNER will advise CONTRACTOR of deficiencies in CONTRACTOR's BABA Act compliance submittals and CONTRACTOR shall promptly correct the deficiencies and resubmit the documentation.

C. See Document 00 45 15 Federal Requirements.

1.10 BASIS FOR COMPENSATION

A. All costs to comply with the requirements of this Section shall be considered to be included in the Contract Price.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 78 50S

SECTION 02 41 13S

DEMOLITION

Delete Standard Specification 02 41 13 SELECTIVE SITE DEMOLITION in its entirety and replace it with the following.

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes providing all supervision, labor, equipment, and materials necessary to:
 - 1. Demolish the structures and systems as noted on the Drawings.
 - 2. Salvage, load, and haul off-site all recyclable materials.
 - 3. Remove concrete and bituminous materials as shown on the Drawings.
 - 4. Load, transport, and dispose off-site all other demolition materials, debris, and rubble.
 - 5. Remove underground pipes, manholes, and vaults as shown on the Drawings.

1.2 RELATED SECTIONS

- A. Section 01 35 00S Special Provisions.
- B. Division 26 Electrical.

1.3 DEFINITIONS

- A. *Demolish* – is to completely remove a specified pipe, fitting, housing, feature, or structure without regard for the conditions of the item after being removed.
- B. *Salvage* – is to remove an item in a condition that allows its reuse for a similar purpose.
- C. *Abandon* – is to leave in place with appropriate measures taken to prevent disturbance of the surrounding Work.

- D. *Protect* – is to take necessary precautions to leave an item unharmed by the Work.
- E. *Reuse* – is to allow specific suitable items to be reused in the Work after salvage.

1.4 REFERENCES

- A. The following are complete titles of references cited in this Section. The date of the standard is that in effect as of the certification date.
 - 1. 29 CFR 1910, Occupational Safety & Health Administration (OSHA)
 - 2. American National Standards Institute (ANSI)
 - a. ANSI A10.6 – Safety and Health Requirements for Demolition Operations

1.5 JOB CONDITIONS

- A. CONTRACTOR shall be solely responsible for evaluating existing facilities and Site conditions and considering all factors that may affect the progress or performance of the Work.
- B. CONTRACTOR shall become the OWNER of materials generated by the demolition efforts and shall dispose or recycle all of the demolition debris in accordance with all applicable law and regulations.
- C. In the event that asbestos containing material (ACM), underground storage tanks or containers, or other hazardous materials are encountered during demolition activities, CONTRACTOR shall immediately stop work in that area and notify ENGINEER.

1.6 SEQUENCING AND SCHEDULING

- A. Coordinate demolition activities with OWNER to provide adequate site access for Work.
- B. Coordinate demolition activities to avoid damaging any portion of the Work.
- C. Take precautions to ensure that structural elements are not overloaded at any point during the demolition and construction Work.

1.7 BASIS FOR COMPENSATION

- A. Compensation for all Work included under this Section shall be as set forth in Section 01 22 00S, Measurement and Payment.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Provide marking materials suitable for duration of service required.

PART 3 EXECUTION

3.1 GENERAL

- A. Site Verification of Conditions

1. Inspect existing conditions and note dimensions, clearances, access, utilities, and protections required.
2. Mark the limits of the civil, architectural, structural, process piping, mechanical, and electrical demolition. Mark any hazardous materials requiring abatement.
3. Note items to be salvaged for reuse in the Work.
4. Note items to be salvaged and returned to OWNER.
5. Provide required protective measures before beginning demolition.

- B. Protection

1. Perform demolition in such a manner as to:
 - a. Eliminate hazards to persons and property,
 - b. Minimize interferences with adjacent spaces, and
 - c. Minimize interruption of existing utilities.
2. Provide safeguards per ANSI A10.6, including warning signs, warning lights, barricades, temporary fences, chutes, and nets as required for protection of personnel, adjacent structures, utilities to remain, and new Work during demolition Work.
3. Provide dust control as required to avoid hazardous or nuisance conditions in the surrounding area.

4. Do not use water for dust control if it results in hazardous conditions such as ice, flooding, or pollution.
- C. Explosives will not be permitted.
- D. Demolish and remove existing construction only to the extent required by new construction and as indicated on the Drawings.
- E. If unforeseen conditions are encountered, or if additional hazardous materials are suspected, obtain instruction from ENGINEER before proceeding with demolition.
- F. In the event of demolition of items not scheduled to be demolished, promptly replace to the approval of ENGINEER at no additional cost to OWNER.
- G. Salvage
 1. Salvage existing items as indicated on the Drawings.
 2. Disconnect, remove, protect, and store salvaged items in a manner that will prevent damage.
 3. Reinstall salvaged items to be reused.
 4. Deliver salvaged items not reused in the Work to OWNER.
- H. Demolition debris including furniture, fixtures, brick, concrete, stones, metals, plastic, mechanical equipment, electrical equipment, vegetation, and earth not intended for reuse in the Work shall become the property of CONTRACTOR.

3.2 BELOW GRADE UTILITY DEMOLITION/ABANDONMENT

- A. Field verify utilities shown on the Drawings.
- B. Protect utilities that will not be abandoned or removed.
- C. Remove or abandon utilities as shown on Drawings.
- D. Buried pipes to be abandoned:
 1. 8-inch or less: securely cap pipe.
 2. 10-inch or greater: fill with grout or flowable fill and cap.
- E. Coordinate the removal of non-OWNER utilities with the appropriate utility OWNER.
- F. Maintain a record drawing of the location of utilities that have been abandoned in place.

3.3 STRUCTURAL DEMOLITION

- A. Demolish structures as indicated on the Drawings.
- B. Saw cut to a full depth, all extents of concrete slabs and structural members to be removed.
- C. Where an abutting structure is to be left in place, make clean, smooth cuts to lines indicated.
- D. Demolish structures to a min. 18 inches below grade if not otherwise indicated on the Drawings.

3.4 ABOVE GRADE PROCESS PIPING DEMOLITION

- A. Demolish process piping, valves, and other appurtenances as shown on the Drawings.
- B. Process piping and valves may be salvaged and reused in the identical service only.
- C. Where stubs remain, cap or plug piping with identical piping material.

3.5 MECHANICAL/ELECTRICAL SYSTEMS

- A. Demolish mechanical and electrical systems as indicated on the Drawings.

3.6 DEMOLITION DEBRIS (NON-HAZARDOUS) DISPOSAL

- A. Burning of materials will not be permitted on the site.
- B. At least weekly, remove demolition debris to maintain suitable site access.
- C. Transport and dispose of demolition debris at a suitable location off-site in compliance with applicable regulations.
- D. On completion of demolition and after removal of all debris, leave site in a clean condition satisfactory to ENGINEER.

END OF SECTION 02 41 13S

SECTION 03 11 00S

CONCRETE FORMS AND ACCESSORIES

Delete Standard Specification 03 11 00 CONCRETE FORMING in its entirety and replace it with the following.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Form work
- B. Shoring
- C. Form accessories
- D. Form coatings

1.2 RELATED SECTIONS

- A. Section 03 20 00S—Concrete Reinforcement
- B. Section 03 30 04S—Cast-in-Place Concrete

1.3 REFERENCES

- A. Current editions of the following standards and publications.
 - 1. ACI SPEC-117, Specifications for Tolerances for Concrete Construction and Materials and Commentary
 - 2. ACI PRC-347, Guide to Formwork for Concrete
 - 3. ACI SP-4, Formwork for Concrete

1.4 SUBMITTALS

- A. No submittals are required for materials and supplies covered under this section which comply with the applicable specifications.

1.5 QUALITY ASSURANCE

- A. Design and engineering of formwork:
 - 1. Responsibility of Contractor.
 - 2. Designed for loadings, lateral pressures, and allowable stresses in accordance with ACI PRC-347 and ACI SP-4.
 - 3. Designed, erected, supported, and maintained to safely support all vertical and lateral loads that might be applied, including construction loads and loads resulting from the placement and vibration of concrete.
 - 4. Formwork supported on ground: Provide satisfactory foundations to carry the loads imposed during and after construction without appreciable settlement.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protected from deterioration, weather, and shrinkage prior to concreting by proper storage, oiling, wetting, or other appropriate methods.
- B. Keep free of rust, rot, or other detrimental forms of deterioration.

1.7 SEQUENCING

- A. Forms designed so they may be removed in proper sequence and without damage to the concrete.
- B. Sequence form erection and removal to match any concrete pours, curing, and any other adjacent or related work which may affect the placement, removal, or availability of any concrete formwork.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Forms: Wood, metal, or other approved material providing a smooth continuous surface in contact with concrete.
- B. Chamfer Strips:
 - 1. Uniform in cross-section dimensions without rounded corners.



2. Smooth on all sides.
3. ¾ inch sides, unless noted otherwise on Drawings.

C. Form Accessories:

1. Commercially manufactured ties and hangers embedded in the concrete.
2. Type which leaves no metal closer than 1 inch from the surface of the finished concrete.

D. Form Release Agent:

1. Non-staining chemical release agent which prevents bonding to concrete.
2. Compatible with the type of form materials used.
3. Acceptable agents include:
 - a. Master Builders Solutions, MasterFinish RL Series
 - b. Eucoslip Form Release
 - c. Nox-Crete form coating
 - d. Approved equal

2.2 FABRICATION

- A. Type: pre-manufactured or constructed on-site.

PART 3 EXECUTION

3.1 PREPARATION

- A. Thoroughly clean of all dirt, mortar, sawdust, and other foreign matter prior to use. Bottoms of forms inaccessible from within to be provided with access panels to permit removal of extraneous materials before placing concrete.
- B. Forms for exposed concrete:
1. Treated with non-staining release agent per manufacturer's recommendation.

2. Avoid placement of release agent on reinforcing steel, embedded anchorages, anchor bolts, bearing plates, or other items which require bonding to concrete.
- C. Openings in formwork:
1. Provide to accommodate any conduits, fixtures, or other appurtenances extending through the formwork.
 2. Accurately locate, securely support, level, plumb, and straight items directly embedded into concrete.
 3. Provide inspection hole as requested by Engineer to verify consolidation of concrete.

3.2 INSTALLATION

- A. Conform to the shape, lines, and dimensions of the components shown on the Drawings, true to line, plumb and level as required in ACI SPEC-117.
- B. Construct forms for exposed concrete to minimize deflection in order to eliminate bulges, off-sets, or other unsightly features in the finished surfaces.
- C. Provide camber to compensate for anticipated deflections in the formwork due to the weight and pressure of the plastic concrete and construction loads.
- D. Provide forms tight to prevent leakage of grout or cement paste.
- E. Chamfer above grade exposed joints, edges, and external corners of concrete 0.75 inch. Place chamfer strips in corners of formwork to produce beveled edges on permanently exposed surfaces.

3.3 FORMWORK REMOVAL

- A. Forms shall be removed in a manner to ensure complete safety of the structure.
- B. Minimum time before removal after placing concrete, unless permitted otherwise:
 1. Footings and slab edges: 24 hours
 2. Walls and piers: 48 hours (24 hours for metal-lined form)
 3. Beams: 14 days, or 7 days without disturbing shores
 4. One-way floor slabs: 7 days, or 3.5 days without disturbing shores

5. Time specified above represents cumulative time during which temperature of concrete is maintained above 50 degrees F.
- C. In any event, do not remove forms or shoring until concrete has acquired sufficient strength to safely support its own weight and construction loads.
- D. Avoid hammering or prying against concrete surfaces to prevent damage to concrete.
- E. Do not place live loads on concrete structures prior to completion of the specified 28-day curing time without approval.
- F. Procedures for re-shoring shall follow the recommendations outlined in ACI PCR-347.

END OF SECTION 03 11 00S

SECTION 03 20 00S

CONCRETE REINFORCEMENT

Delete Standard Specification 03 20 00 CONCRETE REINFORCING in its entirety and replace it with the following.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Reinforcing steel
- B. Welded wire fabric
- C. Tie wire
- D. Reinforcing support

1.2 RELATED SECTIONS

- A. Section 03 11 00S - Concrete Forms and Accessories
- B. Section 03 30 04S - Cast-in-Place Concrete

1.3 REFERENCES

- A. Current editions of the following standards and publications.
 - 1. ACI SPEC-117, Specifications for Tolerances for Concrete Construction and Materials and Commentary
 - 2. ACI PCR-315, Guide to Presenting Steel Design Details
 - 3. ACI CODE-318, Building Code Requirements for Structural Concrete and Commentary
 - 4. ASTM A1064 / A1064M, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
 - 5. ASTM A416/A416M, Standard Specification for Low-Relaxation, Seven-Wire Steel Strand for Prestressed Concrete

6. ASTM A615/A616M, Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement
7. ASTM A706/A706M, Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
8. ASTM A970/970M, Standard Specification for Headed Steel Bars for Concrete Reinforcement
9. ASTM A996/A996M, Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement
10. CRSI, Manual of Standard Practice

1.4 SUBMITTALS

- A. Shop Drawings
 1. Submit at least 15 days prior to start of Work.
 2. Show fabrication dimensions, bar sizes, location for placing reinforcing, and lap locations.
- B. Manufacturer's mill certificates:
 1. Properties of the steel (i.e., mill tests).

1.5 QUALITY ASSURANCE

- A. Identify bar bundles with waterproof mark numbers on tags.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store above the surface of the ground on platforms, skids, or other supports.
- B. Protect from injury and surface deterioration caused by exposure to conditions producing rust.

1.7 SEQUENCING AND SCHEDULING

- A. Schedule placement and securing of reinforcing steel and formwork so that reinforcing work may be reviewed by Engineer before it becomes inaccessible.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Reinforcing bars: ASTM A615, A706, A996 (Type R), or A970. Grade 60.
- B. Welded wire fabric: ASTM A1064.
- C. Prestressing tendons: ASTM A416.
- D. Bar supports: CRSI Manual of Standard Practice
 - 1. Cold-drawn steel wire.
 - 2. Type C plastic protected or type E stainless steel protected.
 - 3. Precast concrete block.
- E. Tie wire: black annealed wire, 16 gauge or heavier.

2.2 FABRICATION

- A. Bent cold to the dimensions required before placing.
- B. Diameter of hooks and bends: ACI PCR-315.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prior to placement of new concrete, clean reinforcement of loose rust and mill scale, earth, ice, cement, mortar, and other materials which reduce or prevent complete bond with concrete.

3.2 INSTALLATION

- A. Do not install bars with kinks or bends not shown on Drawings.
- B. Provide adequate chairs, ties, etc. to prevent bars or welded wire fabric from sagging or deflecting and to hold the reinforcement rigidly against displacement of the concrete.

- C. Precast concrete blocks may be used for concrete placed against ground.
- D. Tie reinforcing with wire at all cross points.
- E. Placement tolerance: ACI SPEC-117.
- F. Minimum concrete cover (unless otherwise specified):
 - 1. Concrete subject to high water flow and abrasion: 6 inches.
 - 2. Concrete cast against and permanently exposed to earth: 3 inches.
 - 3. Concrete exposed to weather: 2 inches.
 - 4. Concrete not exposed to weather or in contact with ground: 1½ inches.
- G. Tack welding of reinforcement is not permitted.
- H. Tension lap splices: ACI CODE-318, Class B, unless noted otherwise on Drawings.

3.3 INSPECTION AND ACCEPTANCE

- A. Do not place concrete until reinforcing steel has been directly observed and accepted by ENGINEER or OWNER's representative for general conformance with the contract documents.
- B. Notify Engineer 24 hours minimum prior to scheduled pour.

END OF SECTION 03 20 00S

SECTION 03 30 04S

CAST-IN-PLACE CONCRETE

Delete Standard Specifications 03 30 04 CONCRETE, 03 30 05 CONCRETE TESTING, 03 30 10 CONCRETE PLACEMENT, 03 35 00 CONCRETE FINISHING, and 03 39 00 CONCRETE CURING in their entirety and replace them with the following.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete curing

1.2 CAST-IN-PLACE ANCHOR BOLTS

- A. Embedded metal
- B. Expansion joint material
- C. Joint sealer
- D. Bonding agent
- E. Vapor barrier
- F. Waterstop
- G. Cutting and coring

1.3 RELATED SECTIONS

- A. Section 02 41 13S - Demolition
- B. Section 03 11 00S - Concrete Forms and Accessories
- C. Section 03 20 00S - Concrete Reinforcement.
- D. Section 03 61 00S - Grouting

1.4 REFERENCES

- A. Current editions of the following standards and publications.
- B. AISC 303, Code of Standard Practice for Steel Buildings and Bridges.
- C. ASTM A36/A36M, Standard Specification for Carbon Structural Steel
- D. ASTM A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
- E. ASTM A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished
- F. ASTM A283/283M, Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
- G. ASTM A563, Standard Specification for Carbon and Alloy Steel Nuts
- H. ASTM A929/929M, Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe
- I. ASTM C31/C31M, Standard Practice for Making and Curing Concrete Test Specimens in the Field
- J. ASTM C33/C33M, Standard Specifications for Concrete Aggregates
- K. ASTM C39/C39M, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
- L. ASTM C94/C94M, Standard Specification for Ready Mixed Concrete
- M. ASTM C138/C138M, Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
- N. ASTM C143/C143M, Standard Test Method for Slump of Hydraulic-Cement Concrete
- O. ASTM C150/C150M, Standard Specification for Portland Cement
- P. ASTM C157/C157M, Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete.
- Q. ASTM C171, Standard Specification for Sheet Materials for Curing Concrete
- R. ASTM C172/C172M, Standard Practice for Sampling Freshly Mixed Concrete.
- S. ASTM C231/C231M, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

- T. ASTM C260/C260M, Standard Specification for Air Entraining Admixtures for Concrete
- U. ASTM C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
- V. ASTM C494/C494M, Standard Specification for Chemical Admixtures for Concrete
- W. ASTM C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
- X. ASTM C989, Standard Specification for Slag Cement for Use in Concrete and Mortars
- Y. ASTM C1064/C1064M, Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
- Z. ASTM C1116, Standard Specification for Fiber-Reinforced Concrete
- AA. ASTM C1240, Standard Specification for Silica Fume Used in Cementitious Mixtures
- BB. ASTM C1602, Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
- CC. ASTM C1611/C1611M, Standard Test Method for Slump Flow of Self-Consolidating Concrete
- DD. ASTM D1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
- EE. ASTM E96/E96M, Standard Test Methods for Water Vapor Transmission of Materials
- FF. ASTM E1745, Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
- GG. ASTM F1554, Standard Specification for Anchor Bolts, Steel, 36, 55, and 105 KSI Yield Strength
- HH. ACI SPEC-117, Specifications for Tolerances for Concrete Construction and Materials and Commentary
- II. ACI PCR-224.1, Causes, Evaluation, and Repair of Cracks in Concrete Structures
- JJ. ACI SPEC-301, Specifications for Concrete Construction.
- KK. ACI PCR-302.1, Guide to Concrete Floor and Slab Construction

- LL. ACI PCR-304, Guide for Measuring, Mixing, Transporting and Placing Concrete
- MM. ACI SPEC-305.1, Specification for Hot Weather Concreting
- NN. ACI SPEC-306.1, Standard Specification for Cold Weather Concreting
- OO. ACI SPEC-308.1, Specification for Curing Concrete
- PP. ACI PCR-309, Guide for Consolidation of Concrete
- QQ. ACI PCR-311, Recommended Practice for Concrete Inspection
- RR. ACI CODE-318, Building Code Requirements for Structural Concrete and Commentary. ACI SPEC-336.1, Specification for the Construction of Drilled Piers
- SS. ACI PCR-347, Guide to Formwork for Concrete
- TT. CSRI Manual of Standard Practice
- UU. International Building Code (IBC) 2018
- VV. State of Utah Building Code
- WW. Local Building Code: Provo City Building Code and Provo City Amendment to State of Utah Building Code

1.5 SUBMITTALS

- A. Manufacturer's descriptive literature and product specifications for each product
- B. Shop Drawings:
 - 1. Steel reinforcing (see Section 03 20 00S)
 - 2. Embedded steel, inserts, anchor bolt and accessories locations
- C. Batch Plant Qualifications per section 2.09
 - 1. Plant's name
 - 2. Address
 - 3. Phone number
 - 4. Distance and travel time to site

D. Concrete Mix Design

1. Submit for each mix at least 30 days prior to scheduled placement date.
 - a. Manufacturer's data and product information relating to all concrete material products
 - b. Certificates of material properties signed by the material producer or processor and CONTRACTOR verifying compliance with Contract material specifications. Include Project name and number, date of report, name of CONTRACTOR, source of material, manufacturer or processor, and brand name for proprietary products.
 - c. Certified mix design by Professional Engineer licensed in the project state
 - d. Basis for mix design (by concrete production facility or laboratory trial mixes in accordance with ACI SPEC-301)
 - e. Identification of aggregate source and compliance test to ASTM requirements
 - f. Compressive strength at 28 days
 - g. Scale weights of each aggregate
 - h. Absorbed water in each aggregate
 - i. Brand, type, and amount of cementitious material in mix
 - j. Proportions of each material required per cubic yard
 - k. Water/Cement ratio
 - l. Weather protection plan in accordance with 3.04.C
 2. Do not change mix designs and supplier unless new batch plant qualifications and mix designs are submitted.
 3. Concrete placement plan: identification of placement sequence, equipment, and techniques.
 4. Load tickets.
- E. Shrinkage performance documentation: CONTRACTOR submit for documentation shrinkage test results for the concrete intended for use on the project.
- F. Curing Compound: If a sprayed-on membrane is used for curing, Submit manufacturer's certification as documentation, verifying that the material furnished

has been tested and conforms to the required tests as described in the appropriate Sections below.

- G. QA Program: Submit for review a concrete production quality assurance program.
- H. Construction Joints: Submit a plan for approval indicating locations and details of any construction joints not shown on the drawings.

1.6 QUALITY ASSURANCE

- A. CONTRACTOR Qualifications: 5 years minimum experience on comparable concrete projects.
- B. Workmen Qualifications:
 - 1. Competent and experienced foreman in placing the types of concrete specified.
 - 2. Trained and experienced concrete finishers.
- C. CONTRACTOR:
 - 1. For each batch of concrete delivered to the jobsite provide one signed copy of the delivery ticket in accordance with ASTM C94 to OWNER's Representative as proof of acceptance or rejection of concrete.
- D. Independent Testing Agency:
 - 1. Trial mix
 - a. Obtain samples
 - b. Perform laboratory testing
 - c. Provide reports on materials, concrete design mixed, and testing performed
 - 2. Field testing: see Part 3

PART 2 PRODUCTS

2.1 CEMENTITIOUS MATERIAL

- A. Portland Cement: ASTM C150, Type I or Type IA or Type II or Type III or Type V.

1. Free from water-soluble salts or alkalies, which will cause efflorescence on exposed surfaces.
- B. Pozzolanic Mineral Admixture
1. Fly Ash: ASTM C618, Class C or F
 2. Minimum amount (if used): 15%, by weight, of total cementitious material
 3. Silica fume: ASTM C1240
 - a. MasterLife SF 100 by Master Builders Solutions
 - b. Approved equal
 4. Slag cement: ASTM C989, Grade 80, 100 or 120
 5. Natural Pozzolans: Natural Pozzolans will conform to ASTM C618 Type N
 - a. MasterLife MK828 by Master Builders Solutions
 - b. Approved equal
- C. Use only one brand and type of cementitious materials.

2.2 AGGREGATES

- A. Fine Aggregates: ASTM C33 for grading
- B. Coarse Aggregates: ASTM C33 for grading
1. Maximum size in accordance with ACI SPEC-301
 2. Gradation must be in accordance with ASTM C33 and class designation 4S.
 3. New or unproven aggregate sources must undergo petrographic examination or other procedures to ensure that they do not have potential alkali reactivity.
- C. Aggregates: Crushed quarry or mine trap rock (basalt, diabase, gabbro, or other related igneous rock types), quartzite, gneiss, or granite. Other igneous or metamorphic quarry or mine rock may be used only with ENGINEER's specific approval. Limestone aggregate will not be acceptable.

2.3 WATERSTOP

- A. Unless otherwise noted, use hydrophilic waterstop as manufactured by Greenstreak (Swellstop), Sika (Sikaswell), or approved equal. Use compatible primer for waterstop per manufacturer's recommendations.
- B. PVC waterstop where indicated on the Drawings are 9"x3/8" PVC serrated with center bulb as manufactured by Greenstreak, Sika, or approved equal.

2.4 WATER

- A. ASTM C1602. Clean, potable, and free from injurious amounts of oils, acids, alkalies, salts, organic materials, or other substances that may be deleterious to concrete or steel.

2.5 ADMIXTURES

- A. No admixtures, except air-entraining agent and water reducing admixture without approval of ENGINEER. Do not use calcium chloride.
- B. Air-entraining admixture: ASTM C260
 - 1. AEA-2 by Euclid Chemical Co.
 - 2. Darex II by W.R. Grace
 - 3. MasterAir Series by Master Builders Solutions
 - 4. Approved equal
- C. Water-reducing admixture: ASTM C494, Type A or Type C
 - 1. Eucon WR 91 by Euclid Chemical Co.
 - 2. WRDA-82 by W.R. Grace
 - 3. MasterPozzolith Series or MasterPolyheed Series by Master Builders Solutions
 - 4. Approved equal
- D. Retarding Admixture: ASTM C494, Type B
 - 1. MasterSet R Series or MasterSet DELVO Series by Master Builders Solutions US LLC

2. Approved equal
- E. Accelerating Admixture: ASTM C494, Type C
 1. MasterSet AC 534 or MasterSet FP 20 by Master Builders Solutions US LLC
 2. Approved equal
- F. Water-Reducing and Retarding Admixture: ASTM C494, Type D
 1. MasterSet R Series or MasterSet DELVO Series by Master Builders Solutions US LLC
 2. Approved equal
- G. Hydration Control Admixture: ASTM C494, Type D
 1. MasterSet DELVO Series by Master Builders Solutions
 2. Approved equal
- H. Water-Reducing and Accelerating Admixture: ASTM C494, Type E
 1. MasterSet FP 20 by Master Builders Solutions
 2. Approved equal
- I. High-Range Water-Reducing Admixture: ASTM C494, Type F
 1. MasterGlenium Series or MasterRheobuild 1000 by Master Builders Solutions
 2. Approved equal
- J. High-Range Water-Reducing and Retarding Admixture: ASTM C494, Type G
- K. Workability-Retaining Admixture: ASTM C494, Type S. Retain concrete workability without affecting time of setting or early-age strength development.
 1. MasterSure Z-60 by Master Builders Solutions
 2. Approved equal
- L. Strength-Enhancing Admixture: ASTM C494, Type S. Liquid crystalline CSH nanoparticle admixture that increases both early- and late-age strength development without affecting concrete setting time.
 1. Master X-Seed 55 by Master Builders Solutions US LLC

2. Approved equal
- M. Permeability Reducing Admixture for Hydrostatic Conditions ASTM C494, Type S. Permeability reducing admixture for hydrostatic conditions with hydrophilic crystalline concrete admixture. Dosage rate determined in accordance with the manufacturer's recommendations. Permeability reducing admixture for hydrostatic conditions delivered, handled, stored, and used in strict accordance with the manufacturer's instructions.
1. Admix C-500/C-500 NF/C-1000/C-1000 NF by Xypex
 2. MasterLife 300 Series by Master Builders Solutions
 3. Approved equal
- N. Corrosion-Inhibiting Admixture: A nominal 30 percent solution of calcium nitrite or an amine/ester-based organic corrosion-inhibiting admixture.
1. MasterLife CI 30 or MasterLife CI 222 by Master Builders Solutions
 2. Approved equal
- O. Shrinkage-Reducing Admixture: ASTM C494, Type S
1. MasterLife SRA 035 or MasterLife CRA 007 by Master Builders Solutions
 2. Approved equal
- P. Viscosity-Modifying Admixture: ASTM C494, Type S
1. MasterMatrix VMA Series by Master Builders Solutions
 2. Approved equal
- Q. Anti-Washout Admixture: CRD-C661
1. MasterMatrix UW 450 by Master Builders Solutions
 2. Approved equal.
- R. Alkali-Silica Reaction Inhibiting Admixture: ASTM C494, Type S. Contain a nominal lithium nitrate content of 30 percent.
1. MasterLife ASR 30 by Master Builders Solutions
 2. Approved equal

- S. Color Pigment: Colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis
 - 1. Master Builders Solutions
 - 2. Approved equal
 - 3. Color: [As indicated by manufacturer's designation] [Match Architect's sample] [As selected by Architect from manufacturer's full range]

2.6 FIBERS

- A. Provide fibers that have a specific gravity of 0.9, a minimum tensile strength of 70 ksi, graded per manufacturer, and specifically manufactured to an optimum gradation for use as concrete secondary reinforcement. Add fibers at the batch plant. Follow manufacturers' recommendations and instructions for mixing.
- B. Synthetic Microfibers: Monofilament or fibrillated polypropylene microfibers engineered and designed for use in concrete, complying with ASTM C 1116, Type III.
 - a. MasterFiber M Series or F Series by Master Builders Solutions
 - b. Approved equal
- C. Synthetic Macrofibers: Synthetic macrofibers engineered and designed for use in concrete as temperature and shrinkage reinforcement, complying with ASTM C1116, Type III.
 - 1. Approved products:
 - a. MasterFiber MAC Series by Master Builders Solutions
 - b. Approved equal

2.7 MIXES

- A. Base proportioning of materials on previous field experience of concrete production facility or by laboratory trial mixes in accordance with ACI SPEC-301 or ACI CODE-318
- B. Minimum 28-day specified compressive strength and required average compression: ASTM C39

Class of Concrete	Maximum w/cm	Compressive Strength & Test Age	Freezing and Thawing (F)	Sulfate (S)	Water Contact (W)	Corrosion Protection (C)
Footings, walls, mat foundation, exterior pads	0.45	4500	F2	S1	W0	C0
Interior Concrete	0.45	4500	F0	S0	W0	C0

C. Required average compressive strength: produce concrete of average compressive strengths unless documented test results substantiate a lower permissible average strength based on the standard deviation established in ACI SPEC-301 or ACI CODE-318.

D. Air-Entrainment

1. For concrete exposed to freezing and thawing:

Nominal Max. Size Coarse Aggregate	Total Air Content
¾ inch	6% ± 1.5
1 inch	6% ± 1.5
1½ inch	5½% ± 1.5

E. Slump: At the point of discharge from the transport vehicle, provide concrete slump as required for CONTRACTOR's means of placement and as indicated on the submitted mix design proportions, so long as there is no visual segregation. The concrete has a Visual Stability Index (VSI) of no more than 1 as measured and defined in ASTM C1611.

F. The amount of fly ash allowed in mass concrete mixes will be based on demonstrations that the mix design meets the required strength per ACI CODE-318. The mix meets the minimum required concrete density and allow for appropriate cure times that do not adversely delay form removal, subsequent placements, or backfilling operations. It should be clarified that exposure class F2 does not contain a limitation on pozzolan content, and the ternary and quaternary blends of cement, flyash, slag, or type N pozzolan are acceptable.

G. Workability

1. Mix workability and handling characteristics demonstrated by past field experience or through a trial slab as suggested in ACI SPEC-301.



H. Shrinkage Potential:

1. Perform ASTM C157 on trial mix to determine length change of concrete with 7 days of moist curing followed by 21 days of drying.
2. Change in length does not exceed 0.05%.

2.8 READY-MIX CONCRETE

- A. Provide concrete from an established, certified ready-mix plant.
- B. National Ready Mixed Concrete Association (NRMCA) certified ready-mix plant

2.9 CURING MATERIALS

- A. Waterproof paper (non-staining): ASTM C171, regular or white
- B. Burlap: commercial quality and non-staining
- C. Polyethylene Sheeting: ASTM C171 (4 mil minimum thickness)
- D. Membrane Curing Compound: ASTM C309
 1. CS-309 Curing & Sealing Compound (VOC) as manufactured by W. R. Meadows, Inc.
 2. MasterKure CC 180 WB (formerly Kure-N-Seal) by Master Builders Solutions
 3. Approved equal

2.10 CAST-IN-PLACE ANCHOR RODS

- A. Anchor rods: ASTM F1554
- B. Heavy hex nuts

2.11 EMBEDDED METAL

- A. Embedded plates, bars, and steel shapes: ASTM A36
- B. Welded Studs: ASTM A108
 1. As manufactured by the Nelson Stud Welding Co.

2. Approved equal (unless noted otherwise)
- C. Pipe: ASTM A53, Grade B

2.12 EXPANSION JOINT MATERIAL

- A. Expansion and isolation material used for interior applications with a sealant. Polyethylene closed-cell joint filler. ASTM D994, Asphalt-impregnated; ASTM D1751 Fiber; or D1752 Type 1 sponge rubber.
1. Ceramar as manufactured by W. R. Meadows, Inc.
 2. Approved equal
- B. Expansion and isolation material used for exterior applications without a sealant. Fiber expansion joint filler conforming to ASTM D1751.

2.13 JOINT SEALER

- A. Sealant for use in floor slab isolation and contraction joints: 2-component polyurethane sealant conforming to ASTM 920, Sonolastic SL2 Sealant as manufactured by Sonneborn, or approved equal.
- B. Sealant for use in wall joints conforming to ASTM 920:
1. MasterSeal NP 1 (formerly Sonolastic NP1) by Master Builders Solutions
 2. Sikaflex-1a as manufactured by Sika
 3. Approved equal
- C. Primer: As recommended by the sealant manufacturer

2.14 BONDING AGENTS

- A. Polymer bonding agent
1. Acceptable products:
 - a. Weldcrete” by Larsen Products Corporation
 - b. “Intralok” by W.R. Meadows
 - c. Or approved equal

2. Use to bond surfaces of existing concrete to new concrete

2.15 UNDERSLAB VAPOR BARRIER

- A. Vapor barrier: ASTM E1745, Class C
 1. Reinforced polyethylene vapor barrier with a perm rating of less than 0.1 (ASTM E96, Procedure A)
 2. Rufco 400 SSB by Raven Industries
 3. Approved equal

PART 3 EXECUTION

3.1 PREPARATION

- A. Remove water from excavations before concrete is deposited. Divert any flow of water through proper side drains and remove without flowing over freshly deposited concrete.
- B. Do not place concrete on frozen ground.
- C. Apply form coating on formwork (see Section 03 11 00S). Apply prior to placing reinforcing steel, anchoring devices, and embedded items.
- D. Prior to concrete placement, install, prepare, and inspect concrete reinforcement per Section 03 20 00S.
- E. Subgrade to be well drained, free of frost, and moisture at the time of concrete placement. If necessary, dampen with water in advance of concrete placement, but no free water standing on either the subgrade or any muddy or soft spots when the concrete is placed.
- F. Screeds: Properly support to maintain required thickness of slabs. Place bulkheads to construction joint limits.
- G. Remove laitance from previously placed or existing concrete; thoroughly clean surface and apply bonding agent before placing concrete.
- H. Install items to be embedded in concrete. Fasten embedded items securely into position before placing concrete.

- I. Anchor rod placement
 - 1. Layout: use experienced construction surveyor
 - 2. Set anchor rods using plywood, steel, and embedded templates (if necessary). Secure with nuts on each side of template.
 - 3. Anchor rod protection
 - a. Coat anchor rod threads with grease and wrap with burlap
 - b. Plug or cap anchor rod sleeves

- J. Tolerances: AISC 303, Section 7.5.1

3.2 TRANSPORTING CONCRETE: ASTM C94

- A. Discharge and place in its final position concrete delivered to the site in watertight revolving-drum trucks within 90 minutes, or before the drum has revolved 300 revolutions, whichever comes first, after the introduction of the mixing water to the cement and aggregates or the introduction of the cement to the aggregates.

- B. Truck operator to provide a copy of each ticket to the Purchaser by the at the time of delivery. Tickets indicate the mix identification, the number of yards delivered, the quantities of each material in the batch, the outdoor temperature in the shade, the time at which the cement was added, the maximum amount of water that can be added at the site, and the numerical sequence of the delivery.

3.3 JOINTS

- A. Locate and install construction joints indicated in the Drawings so they do not impair strength or appearance of the structure, as acceptable to ENGINEER.

- B. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as indicated otherwise.

- C. Provide waterstops in construction joints as indicated. Install waterstops to form continuous diaphragm in each joint. Protect exposed waterstops during progress of Work according to the manufacturer's instructions. Field-fabricate joints in waterstops according to manufacturer's printed instructions.

- D. Construct isolation joints in slabs-on-ground at points of contact between slabs-on-ground and vertical surfaces, such as foundation walls, and other locations, as indicated.

- E. Place concrete in horizontal or vertical strips between construction joints. Adjacent strips allowed to cure before a new strip is placed against a previously placed strip, to reduce construction joint shrinkage gaps.
- F. All lift joint surfaces of mass concrete cleaned and freed of loose materials, mud, laitance, puddles, or ponds of free surface water, coatings, and any detrimental materials. High-volume low-pressure water washing and/or water jetting may be used for removal of loose materials. High-pressure water jetting and/or wet sand blasting followed by mild high-volume, low-pressure washing used on all hardened concrete surfaces as necessary for the removal of laitance, coating, and stains.

3.4 PLACING CONCRETE

- A. Remove hardened concrete debris and foreign materials from the inner surfaces of conveying equipment.
- B. Clean and free existing concrete surfaces receiving new concrete from loose concrete, debris, or other materials that might interfere with bond between existing and new concrete.
- C. Weather Protection
 - 1. Cold Weather
 - a. Applies to concrete placed when the ambient temperature is below 40 degrees F.
 - b. Conform to recommendations and requirements of ACI SPEC-306.1.
 - c. Concrete damaged by freezing to be removed and replaced at CONTRACTOR's expense.
 - 2. Hot Weather
 - a. Applies to concrete placed when the ambient temperature exceeds 90 degrees F.
 - b. Conform to recommendations and requirements of ACI SPEC-305.1.
 - c. Concrete not properly amalgamated due to hot weather to be removed and replaced at CONTRACTOR's expense.
- D. Place concrete continuously in each section until complete. Concrete surfaces not permitted to stand more than 30 minutes before new concrete is placed against them.
- E. Avoid segregation during placement. Place in uniform lifts not to exceed 18 inches.

- F. Do not drop concrete more than 5 feet. When greater drops are required, employ drop chutes or other approved means.
- G. Pre-wet surfaces with water with no standing water before concrete is placed.
- H. Prevent splashing of the forms or reinforcement with concrete. Any splashes or accumulations of hardened concrete on the forms or on any items to be embedded in the concrete above the general level of the concrete already in place must be removed before the Work proceeds.
- I. Placement Time Limitations
 - 1. Complete discharge of concrete within 90 minutes after the introduction of the mixing water to the cement and aggregates or the introduction of the cement to the aggregates. This limitation may be waived by the purchaser if the concrete is of such slump or slump flow after the 90 minutes time has been reached that it can be placed, without the addition of water to the batch. In hot weather, or under conditions contributing to rapid stiffening of the concrete, a time less than 90 minutes is permitted to be specified by the purchaser.
 - 2. For all concrete containing less than 250 pounds per cubic yard of ASTM C150 Portland cement, the concrete must be placed within 120 minutes after batching. Concrete which is showing signs of rapid setting, as determined by OWNER, OWNER's Representative, or ENGINEER, may be rejected.
- J. Consolidation
 - 1. Consolidate concrete by vibration so that concrete is worked around the reinforcement, around embedded items, and into corners of forms.
 - 2. Use internal vibrators of the largest size and the most powerful that can be properly used in the Work, per ACI SPEC-301.
 - 3. Vibrators to be operated by competent workmen.
 - 4. Do not use vibrators to transport concrete within forms.

3.5 FINISHING

- A. All exposed corners of walls that are cast to their permanent height must have a $\frac{3}{4}$ inch chamfer (i.e., those walls that will be extended in the future structure raises, if applicable, do not have chamfers). Alternately, match the chamfer dimension of adjacent or in line wall edges.
- B. Unformed Surface

1. Top of Walls and Other Unformed Surfaces: Strike smooth and float to a texture consistent with finish of adjacent formed surface.

C. Formed Surface

1. Patch tie holes. Repair surface defects according to ACI SPEC-301.
2. Rough form finish of concrete not exposed: Chip off or rub off fins exceeding ½ inch in height.
3. Smooth form finish of exposed concrete: Remove fins exceeding 1/8 inch in height.

D. Exterior Concrete Walks and Parking Areas: ACI PCR-302.1, Class 3

1. Screed with straight edge immediately after placing concrete, bring surface to required elevations.
2. Initial Floating: Bull float by hand before any excess moisture or bleeding water is present on surface.
3. Waiting: no subsequent operations performed until concrete is stiff enough to sustain foot pressure with approximately ¼ inch indentation.
4. Edge joints for contraction joints not saw-cut, provide joint ¼ of depth of slab.
5. Final Floating: Use either hand float or power float, cut down any ridges and fill troughs with mortar. Remove excess material.
6. Steel-trowel concrete surfaces, immediately after final floating, to a smooth, dense, uniform surface free of blemishes, ripples, and trowel marks.
7. Final finish: lightly broom, non-slip finish of freshly troweled concrete.
8. Finish slabs to a surface tolerance of not more than 1/4 inch in 10 feet as determined by a 10-foot straightedge placed anywhere on the slab in any direction.

E. Slab-on-Ground Flatwork: ACI PCR-302.1, Class 4

1. Screed with straight edge immediately after placing concrete, bring surface to required elevations.
2. Initial Floating: Bull float by hand before any excess moisture or bleeding water is present on surface.
3. Waiting: no subsequent operations performed until concrete is stiff enough to sustain foot pressure with approximately ¼ inch indentation.

4. Final Floating: Use either hand float or power float, cut down any ridges and fill troughs with mortar. Remove excess material.
5. Steel-trowel concrete surfaces, immediately after final floating, to a smooth, dense, uniform surface free of blemishes, ripples, and trowel marks.
6. Provide second and third trowelings.
7. Floor Flatness/Levelness Numbers: F_F-25 , F_L-20 .
8. Protect finished concrete surfaces from damage.

F. Crack Repair:

1. The evaluation and repair of cracks must conform to recommendations set forth in ACI 224.1R. Perform crack sealing as a part of the crack repair plan and requirements referenced in 2.16.
2. Seal any shrinkage cracks in excess of 0.012 inches (0.3mm) in width with *Roadware 10 Minute Concrete Mender* or other approved product.

G. Repair of Surface Defects: ACI SPEC-301

1. Surface defects include tie holes, honeycombed areas, and spalled and pitted areas resulting from concrete sticking to the forms.
2. Fill tie holes with patching mortar after being cleaned and thoroughly dampened.
3. Repair of surface defects other than tie holes:
 - a. Provide $\frac{1}{2}$ inches to $\frac{3}{4}$ inch deep saw cut around perimeter
 - b. Remove unsound concrete
 - c. Dampen patch area plus an additional 6 inches beyond perimeter
 - d. Apply bonding agent by thoroughly brushing into surface
 - 1) Bonding Grout: One part cement, one-part fine sand with water to consistency of thick cream.
 - e. Apply batching mortar when bond coat loses water sheen.
 - f. Patching mortar
 - 1) Same materials as concrete to be patched with no coarse aggregate.
 - 2) Do not use more than one part cement to $2\frac{1}{2}$ parts sand by loose volume.

- 3) For exposed surfaces, make trial batch to check color compatibility with repair surface. Substitute white cement if color is too dark.
 - 4) Use mortar at a stiff consistency. Add no more mixing water than required for handling and placing.
- g. Do not use proprietary compounds for adhesion or as patching ingredients without approval.

3.6 CURING AND PROTECTION: ACI SPEC-301 AND SPEC-308.1

- A. General: Protect all concrete against mechanical damage until the completion of Work.
- B. Curing: Cure concrete in accordance with ACI SPEC-301 and 308.1, using either wet cure or curing compound.
- C. Start curing as soon as free water has disappeared from unformed surfaces or immediately after forms are removed.
- D. Accomplish curing and protection by preventing loss of moisture, rapid temperature change, mechanical injury, or damage from rain, frost, or flowing water for at least 7 days.
- E. Formed surfaces may be cured by leaving forms in place.
- F. Unformed surfaces, slab surfaces, and surfaces from which forms have been removed: Cure by one of the following application methods:
 1. Absorptive mats or fabric kept continuously wet.
 2. Waterproof sheet materials.
 3. Curing compound.
 - a. Apply the compound according to manufacturer's directions
 - b. Apply immediately after finishing operations are completed or after forms are removed.
 - c. Apply sufficient quantity to ensure the formation of a continuous unbroken film over the entire area of the exposed surface. Re-spray surfaces damaged by subsequent construction operations during the curing period.
 - d. Keep surfaces coated with curing compound free of foot and vehicular traffic and other sources of abrasion during the curing period.

- e. Do not use of any membrane material which will impart a slippery surface to the concrete or alter its natural color.
- f. If the concrete surfaces, which are to receive curing compound, are expected to be exposed to freezing temperatures within 5 days, do not use the membrane-curing compound.

3.7 FLOOR HARDENER

- A. Treat interior concrete floor areas exposed in the finished work with floor hardener applied in accordance with manufacturer’s instructions. Before treatment application, thoroughly cure and free of oil, grease, or other foreign materials which might interfere with penetration of the hardener into the pores of the cement surface.
- B. Areas to receive carpet, resilient flooring, or other types of finish-floor material will not require a floor-hardening treatment.

3.8 CAST-IN-PLACE CONCRETE TOLERANCES: ACI SPEC-117

3.9 FIELD TESTING

- A. Performed by an Independent Testing Agency retained and paid for by CONTRACTOR
- B. Obtain composite samples of fresh concrete according to ASTM C172. Test samples will be taken at the point of placement.
- C. Test Frequency

Test	Frequency
Air Content (ASTM C231)	Pre-test first load before unloading and test each time a set of compressive strength test cylinders are cast. In addition at least two air content tests on randomly selected batches for each class of concrete produced during each 8-hour or less period of concrete production each day.
Slump (ASTM C143)	Pre-test first load before unloading and test each time a set of compressive strength test cylinders are cast. In addition at least two slump tests on randomly selected batches for each class of concrete produced during each 8-hour or less period of concrete production each day.



Test	Frequency
Temperature (ASTM C1064)	Each time set of compressive strength test cylinders are cast and hourly when air temperature is less than 40°F and greater than 80°F.
Density (ASTM C138)	Each time air content is measured.
Concrete Cylinders (ASTM C31)	Set of four 6-by-12 in. cylinders or set of five 4-by-8 in. cylinders for each class of concrete, for initial 50 cy, and then for every subsequent 150 cy each day or one set each day. If total volume of concrete is such that frequency of testing required provide less than five strength tests for a given class of concrete, sample from at least five randomly selected batches or from each batch if fewer than five batches are used.
Compressive Strength (ASTM C39)	One cylinder break at 7 days. Two 6-by-12 in or three 4-by-8 in cylinder breaks at 28 days. One cylinder retained for future break.
Shrinkage (ASTM C157*)	Samples cast during first placement of each class of concrete (e.g., Piers, Walls, Baffles, etc.) for each construction season.

* Shorten wet curing period to 7 days.

- D. Perform additional tests when excessive variation in workability is observed.
- E. In the event that tests indicate that concrete placed does not conform to specifications, take corrective measures to correct the deficiency at no additional cost to OWNER.
- F. When the slump is greater than the range stated in the mix design and the Visual Stability Index (VSI) is higher than 1 per ASTM C1611, OWNER or OWNER's Representative will reject the concrete and CONTRACTOR must remove the concrete from the Site. Addition of water to compensate for stiffening of the concrete before placing will not be allowed.
- G. Air content determinations will be made by OWNER or OWNER's Representative. If the measured air content falls outside of the specified limits, the placing of concrete must immediately be stopped, and OWNER or OWNER's Representative will immediately make another air content determination from the same batch. Additional air-entraining admixture may be added at the Site to compensate for loss of air-entrainment provided the concrete is then rotated in the mixer or ready-mix truck a minimum of 30 revolutions and is retested for air and slump. In the event of a second failure, the concrete is considered to have failed to comply with the Specifications, and CONTRACTOR must remove all of the concrete of that batch from the Site.

- H. Concrete not meeting specification requirements to be rejected and removed from the site at CONTRACTOR's expense.
- I. Laboratory-cured Test Cylinders
 - 1. Cover and keep at air temperature between 60 degrees and 80 degrees F for the first 24 hours. At end of 24 hours, carefully transport cylinders to testing laboratory.
 - 2. Acceptance test results are the strengths of the two specimens tested at 28 days.
- J. Field-cured Test Cylinder (if CONTRACTOR or OWNER requests)
 - 1. Use for determination of form removal
 - 2. Check adequacy of curing
 - 3. Provide additional confirmation of 28-day strength
 - 4. Place the cylinder as near as possible to the final location of the concrete from which the sample was taken.
 - 5. Provide the same curing and protection as the adjacent concrete.
- K. In the event that tests indicate that concrete placed does not conform to specifications, take corrective measures to correct the deficiency at no additional cost to OWNER.
- L. Shrinkage
 - 1. Samples will be cast from concrete delivered to the site and tested for shrinkage using the method described in Section 2.03.C "Concrete Shrinkage Performance" by OWNER's Representative and test results reported to OWNER and ENGINEER at an age of 14, 21 and 35 days.
 - 2. If the shrinkage result is higher than 0.045 percent, or will, in the opinion of ENGINEER, be exceeded after 7 days of wet curing and 28 days of drying (total 35 days from casting), concrete operations halt and ready-mix producer must adjust mixture or batching operations to bring shrinkage back within tolerance. All costs associated with the disposition of non-conforming concrete must be paid by CONTRACTOR, up to and including removal of the concrete, as determined by ENGINEER and OWNER.
- M. Cracks: Cast-in-place concrete will be inspected for cracks by ENGINEER. CONTRACTOR must provide OWNER or ENGINEER safe access to the Work and coordinate project schedule to allow inspections to take place prior to removal of cofferdams.

3.10 EXISTING CONCRETE REMOVAL, CUTTING OR CORING

- A. See specification 02 41 13S for removal of existing concrete.
- B. Sawcut concrete along straight lines to a depth of a minimum 2 inch or to a depth shown on the drawings. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete. Provide square, straight edges and corners. Where existing adjoins new work.
- C. Remove sawcut slabs from the project site unless it is going to be re-used.
- D. Control and dispose of wastewater from saw cutting and cleanup in accordance with local or state environmental requirements.
- E. Drill cores by any approved standard and accepted method of rotary rock core wireline drilling using diamond-set coring bits by means of which continuous and complete cores of standard diameter for the specified bit size obtained. Use the core drill product of one of the standard core drill manufacturing companies designed primarily for this type of work. Use a ball-bearing, swivel-type, double-tube NX core barrel or manufacturers' equivalent. Capacity of barrels does not exceed 15 feet of core and must equipped with diamond-set core bits and standard core lifters. Supplies for core drilling must include all casing, drill rods, core barrels, diamond-set coring bits, piping, pumps, water, tools, core boxes, and power required for drilling. Set bits with the proper size stones for drilling the concrete and bed rock.
- F. Disposition of core samples is CONTRACTOR's responsibility.
- G. Upon completion of core drilling, the holes must be backfilled with portland cement grout or mortar.

3.11 CLEANUP

- A. After completion of concrete Work, leave the structure and surrounding area clean and neat for commencement of subsequent construction or equipment installation.

END OF SECTION 03 30 04S

SECTION 03 61 00S

GROUTING

Delete Standard Specification 03 61 00 CEMENTITIOUS GROUTING in its entirety and replace it with the following.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cement grout
- B. Non-shrink grout
- C. Epoxy grout

1.2 RELATED SECTIONS

- A. Section 03 11 00S—Concrete Forms and Accessories
- B. Section 03 20 00S—Concrete Reinforcement
- C. Section 03 30 04S—Cast-in-Place Concrete

1.3 REFERENCES

- A. Current editions of the following standards and publications.
 - 1. ASTM C109/C109M, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (using 2 inch or 50 mm cube specimens)
 - 2. ASTM C1107/C1107M, Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)

1.4 SUBMITTALS

- A. Manufacturer's literature:
 - 1. Cement grout

2. Non-shrink grout
3. Epoxy grout

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in original, unopened containers with manufacturer's name, labels, product identification, and batch numbers. Store as recommended by manufacturer.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Cement Grout:
 1. Portland cement, sand, and water sufficient for placement and hydration
 2. Minimum compressive strength (28 days): 5000 psi
- B. Non-Shrink Grout: ASTM C1107
 1. Premixed, packaged ferrous or non-ferrous aggregate shrink-resistant grout
 2. Non-metallic, non-gas forming, and free of corrosive-type material
 3. Minimum compressive strength (28 days), ASTM C109: 7,000 psi
 4. Acceptable products:
 - a. Five-Star non-shrink, non-metallic grout
 - b. MasterFlow 928 Grout by BASF (Master Builders)
 - c. Crystex by L&M Construction Chemicals, Inc.
 - d. Approved equal
- C. Epoxy
 1. To be placed below equipment base plates where high precision, higher compressive strength, or higher torques, impacts or vibrations are expected
 2. Acceptable products:

- a. MasterFlow 648 by BASF (Master Builders)
- b. Five-Star DP Epoxy Grout by Five Star Products
- c. Or approved equal

D. Epoxy Adhesive

- 1. For the post installation of adhesive anchoring systems.
 - a. Or approved equal

2.2 EQUIPMENT

- A. Grouting Equipment: Capable of continuous mechanical mixing that will produce grout free of lumps and undispersed cement.
- B. Clean oil, ice, or other deleterious substances from grouting equipment.

PART 3 EXECUTION

3.1 PREPARATION

- A. Remove all debris, standing water, ice, and any loose or deleterious materials from the surfaces where grout is to be applied before grouting.

3.2 INSTALLATION

- A. Do not grout if it is raining or snowing, or if rain or snow appears imminent and the area of application is not adequately protected.
- B. Protect surface near work area due to the mixing, handling, and application of grout material.
- C. Place grout in a neat and orderly fashion in the designated areas.

END OF SECTION 03 61 00S

SECTION 04 05 13S

MORTAR

Add this Supplemental Specification to the Contract Documents.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Mortar material for project masonry work.

1.2 RELATED SECTIONS:

- A. Section 03 30 04S Cast-In-Place Concrete
- B. Section 04 05 16S Masonry Grout
- C. Section 04 05 23S Masonry Accessories
- D. Section 04 22 00S Concrete Unit Masonry

1.3 REFERENCES

- A. Current editions of the following standards and publications.
 1. ASTM C91, Standard Specification for Masonry Cement
 2. ASTM C144, Standard Specification for Aggregate for Masonry Mortar
 3. ASTM C150/C150M, Standard Specification for Portland Cement
 4. ASTM C207, Standard Specification for Hydrated Lime for Masonry Purposes
 5. ASTM C270, Standard Specification for Mortar for Unit Masonry
 6. ASTM C780, Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
 7. ASTM C979/C979M, Standard Specification for Pigments for Integrally Colored Concrete

1.4 SUBMITTALS

- A. Design mix, indicating proportion or property method used and required environmental conditions.
- B. Field method of measuring volumes of materials to be used for design mix.
- C. Test reports on mortar indicating conformance to ASTM C270.
- D. Samples of available colored mortar for use with face brick. Demonstrate color (hue and tone) and texture. ENGINEER to select color to use from these available samples.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Protect mortar materials from the elements and other damage during delivery. Store cement and lime in watertight enclosures with elevated floors. Protect sand from rainfall.

1.6 SEQUENCING AND SCHEDULING

- A. Schedule production of mortar material to coincide with masonry erection work.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Follow recommended practices set forth in Section 04 05 16S of these Specifications.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Mortar materials:
 - 1. Portland Cement: ASTM C150, Type 1, Gray Color
 - 2. Hydrated Lime: ASTM C207, Type S
 - 3. Sand: ASTM C144
 - 4. Water: Clear, potable, and free of deleterious amounts of acid, alkaline and organic materials.

5. Mortar Admixture: Rheopel Plus Mortar Admixture or Rheopel Plus D powdered masonry water-repellent admixture as manufactured by BASF Corporation – Admixture Systems, or OWNER approved equal.
 6. Coloring at Face Brick: ASTM C979, Pigments for integrally colored, concrete, finely milled (95 to 99% minus 325 mesh) inert, stable to atmospheric conditions, weather resistant, alkali resistant and free of fillers and extenders.
- B. General: Use only those materials specified in this section of the Specifications for mortar for unit masonry. Use Type M mortar for all unit masonry mortar below or in contact with ground on this project. Use Type S or Type M at all other locations. Do not use admixtures, calcium chloride, salts, or anti-freeze compounds, except for acceptable coloring additive.
- C. Reinforced Concrete Masonry: Mortar for use in reinforced concrete masonry: ASTM Designation C270.
- D. Mortar for repointing defective mortar joints in unit masonry: same type as originally used to lay up the work.

2.2 TESTING MORTAR

- A. Determine the water retentivity and compressive strength of mortar in accordance with the test procedures described in ASTM C91.
- B. Mix mortar for testing in the laboratory from representative samples of mortar materials and proportions to be used in the construction.
- C. Testing for mortar composition and mortar properties: ASTM C780.

PART 3 EXECUTION

3.1 APPLICATION

- A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270.
- B. Mixing: Accurately measure mortar materials such that the specified proportions are controlled and accurately maintained. Mix sand, lime and cement dry to a uniform color, with water being added to bring the mortar to proper consistency for use. Workability or consistency of mortar on the board shall be such that mortar is sufficiently wet to be worked under trowel. Mix the mortar at least 3 minutes after the

water is added in a drum-type mechanical mixer. Thoroughly clean the mixer after discharging each batch. Perform mixing to assure uniform color throughout exterior.

- C. Placement: Used mortar within 2½ hours of initial mixing. Discard mortar not used within this time. Retemper mortar by adding water and remixing at any time within 2 hours after initial mixing to restore its workability.
1. Before any masonry units are laid, clean the top surface of the concrete foundation or wall. If the concrete surface is soiled and not clean, at the ENGINEER's discretion, sandblasting, chipping, or scarifying may be required, at the CONTRACTOR's expense, to ensure a good bond of the masonry and concrete.
- D. Mortar Bedding and Joints: Lay hollow units with full mortar coverage on horizontal and vertical face shells. Bed webs in the starting course on footings and solid foundation walls, and where adjacent to cores to be reinforced and/or filled with grout or concrete. Mortar bedding for the first course of blocks to be grouted shall not fill the area under the block cores; grout shall come into direct contact with the concrete foundation or wall.
1. Lay solid units with full head and bed joints.
 2. Horizontal and vertical face joints: uniform in width and 3/8-inch-thick unless otherwise indicated.
 3. Tool horizontal joints before vertical joints.
 4. Compress all exposed masonry joints with a jointing tool to form a dense, smooth, concave joint. Compress all non-exposed masonry joints with the mason's trowel to form a struck joint.
 5. Clean mortar from exposed faces immediately and keep the faces free from droppings.
 6. Remove mortar protrusions extending into cavities or cells to be reinforced and grouted.
 7. Spread mortar at cavity walls or cells to be reinforced so that it is back ½ inch from the edge or trowel the mortar forming a beveled bed to prevent the mortar from protruding or falling into the grout space or cavity.
 8. When patching or pointing must be done after the mortar has hardened, chisel out the joint to a depth of ½ inch, thoroughly wet, and repoint with fresh mortar.
 9. The method of measuring materials for mortar shall be such that proportions of the materials can be controlled.

3.2 FIELD QUALITY CONTROL

- A. Establish and maintain quality control for Work covered under this section of the Specifications to assure compliance with contract documents and maintain records of quality for all operations including, but not limited to the following:
1. A copy of design mix on-site.
 2. Keep onsite a copy of method of measuring materials.

END OF SECTION 04 05 13S

SECTION 04 05 16S

MASONRY GROUT

Delete Standard Specification 04 05 16 MASONRY MORTAR AND GROUT in its entirety and replace it with the following.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Bond beams, lintels, wall cores with reinforcing, and cavity walls.
- B. Mortar, unit masonry and masonry accessories are not included in this Section.

1.2 RELATED SECTIONS

- A. Section 04 05 13S Mortar
- B. Section 04 22 00S Concrete Unit Masonry

1.3 REFERENCES

- A. Current editions of the following standards and publications:
 1. ASTM C39/39M, Specification for Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens
 2. ASTM C94/C94M, Specification for Ready-Mix Concrete
 3. ASTM C143/C143M, Standard Method of Test For Slump of Portland Cement Concrete
 4. ASTM C144, Specification for Aggregate for Masonry Mortars
 5. ASTM C150/C150M, Specification for Portland Cement
 6. ASTM C404, Specification for Coarse Aggregate
 7. ASTM C476, Specification for Grout for Masonry

8. ASTM C1019, Specification for Sampling and Testing Grout

1.4 SUBMITTALS

- A. Design mix, indicating proportions used, required environmental conditions and admixture limitations.
- B. Field method of measuring volumes of materials to be used for the design mix for grout batched on-site.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Protect grout material not mixed and delivered by a ready-mix plant from the elements and other damage during construction. Store cement in a watertight enclosure with an elevated floor. Protect aggregate from rainfall.

1.6 SEQUENCING AND SCHEDULING

- A. Coincide with the related Work and adjacent work areas to correspond with required set and cure times of grout material, material surfaces to which grout is applied, and to correspond with the erection schedule of attached and adjacent hardware items.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Maintain packaged materials clean, dry, and protected against dampness, freezing and foreign matter.
- B. Maintain materials and surrounding air temperature to at least 50 degrees F before, during and 48-hours after completion of masonry work.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Masonry grout:
 1. Portland Cement: ASTM C150, Type 1, Gray Color
 2. Fine Aggregate: ASTM C144

3. Coarse Aggregate: ASTM C404
 4. Water: Clear, potable, and free of deleterious amounts of acid, alkaline and organic materials
- B. Proportion grout fill required at all bond beams, lintels and wall locations as shown on the Drawings according to Table 1 of ASTM C476 for fine grout. If the minimum horizontal dimension of the space to be grouted is 4 inches, coarse grout may be used.
1. Mix and deliver grout in accordance with the requirements for ready-mix concrete under ASTM C94 or mixed on-site in quantities needed for immediate use in accordance with ASTM C476 for fine grout.
 2. Fluid consistency grout but only fluid enough to pour or pump without segregation.
- C. In no case will mortar be accepted as a substitute for grout, except where indicated on the Contract Drawings.

2.2 TESTING GROUT

- A. Measure consistency of grout using a slump test in accordance with ASTM C143.
- B. Test grout mix in accordance with ASTM C1019.
- C. Perform compressive strength test in a damp condition in accordance with ASTM C39.
- D. Minimum 28-day compressive strength of 2,000 psi with a slump of 7 to 8 inches.

PART 3 EXECUTION

3.1 APPLICATION

- A. Surface Preparation: Before grout is placed, remove all debris, standing water, excess mortar, ice and any loose or deleterious materials from the surfaces where grout is to be applied.
- B. Environmental Conditions: Do not apply grout if it is raining or snowing, or if rain or snow appears imminent and the area of application is not adequately protected.
- C. Mixing Equipment: When a batch mixer is used on the job site, thoroughly mix all materials for a minimum of 5 minutes. Discard grout not placed within 1½ hours after

water is first added to the batch. The method of measuring materials for grout shall be such that proportions of the materials can be controlled.

1. Clean equipment used to mix and apply the grout material of oil, ice, or other deleterious substances.
- D. Protection: Take precautions to avoid damage to any surface near the Work area due to the mixing, handling and application of grout material.
- E. Workmanship: Apply grout to the designated areas in a neat and orderly fashion, free from voids and spillage. Level Finish, with reinforcement, inserts, and accessories firmly supported during placement.
- F. Placement: Place grout by low lift grouting methods only.
 1. For low lift grouting, do not build the wall to a height exceeding 5 feet before grout is pumped or poured into the cores. Do not drop grout through space any distance more than necessary and in no case more than 4 feet. Consolidated grout in accordance with Specification Section 03 30 04S. Stop the level of grout at least ½ inch from the top of masonry at intermediate pours.
 2. Do not displace reinforcement while placing grout. Mechanically vibrate or rod spaces containing grout during placement to ensure complete filling of the grout spaces.
 3. Use metal lath under bond beams or other blocks to confine the grout to flow in the required cores only.
 4. Complete the grouting of any section of wall in one day with no interruptions greater than one hour.

3.2 FIELD QUALITY CONTROL

- A. Establish and maintain quality control for Work covered under this section to assure compliance with the Contract Documents and maintain records of quality for all operations including, but not limited to, the following:
 1. A copy of design mix on-site
 2. Record of grout pours: locations, dimensions, and volume of pours

END OF SECTION 04 05 16S

SECTION 04 05 23S
MASONRY ACCESSORIES

Add this Supplemental Specification to the Contract Documents.

PART 1: GENERAL

1.1 DESCRIPTION

- A. Metal ties, steel reinforcement, control joints, weep holes, masonry cell insulation, precast concrete trim, and plastic flashing for concrete masonry work.
- B. Mortar, grout, and unit masonry are not included in this Section.

1.2 RELATED SECTIONS:

- A. Section 04 05 13S Mortar
- B. Section 04 05 16S Masonry Grout
- C. Section 04 22 00S Concrete Unit Masonry

1.3 REFERENCES

- A. Current editions of the following standards and publications:
 - 1. ASTM A82, Specification for Steel Wire, Plain, for Concrete Reinforcement
 - 2. ASTM A116, Specification for Zinc-Coated (Galvanized) Steel Woven Wire Fence Fabric
 - 3. ASTM A153, Specification for Zinc-Coated (Hot Dip) on Iron and Steel Hardware
 - 4. ASTM A185, Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement
 - 5. ASTM A615, Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
 - 6. ASTM A616, Specification for Rail-Steel Deformed and Plain Bars for Concrete Reinforcement

7. ASTM A617, Specification for Axle-Steel Deformed and Plain Bars for Concrete Reinforcement
8. ASTM B227, Specification for Hard-Drawn Copper-Clad Steel Wire

1.4 SUBMITTALS

- A. Product data, samples, and Shop Drawings for cast stone trim.
 1. Include product data and full range of manufacturer's colors and textures.
 2. Show fabrication and installation details for cast stone trim units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store steel reinforcing and metal ties above the ground surface on platforms, skids or other supports, and reasonably protect from injury and surface deterioration caused by exposure to conditions producing rust.
- B. When placed in the Work, reinforcement to be free of injurious seams, flaws, cracks, scale, rust or other foreign materials.

1.6 SEQUENCING AND SCHEDULING

- A. Schedule installation of masonry accessories to coincide with masonry erection work.

PART 2: PRODUCTS

2.1 MATERIALS

- A. Metal Ties and Anchors: Minimum tensile stress of 30,000 psi.
 1. Wire which serves as lateral ties in multi-wythe masonry walls: corrosion-resistant metal (ASTM A82) or coated with a corrosion-resistant metal, such as copper, zinc, or other metal having equivalent or better corrosion-resistant qualities. Coatings for multi-wythe reinforcement: meet or exceed the coatings listed for single wythe reinforcement listed later in this Section.
 2. Lateral metal ties: not less than No. 9 gage thickness or be crimped. Adjustable and part of a prefabricated joint reinforcement which includes lateral and longitudinal ties. Only ladder or truss type joint reinforcement, with ties spaced at

16 inches o.c., will be allowed. Do not restrain transverse movement of the two wythes.

- a. Furnished joint material: AA wire product AA525 or AA625 or an approved equal.
 3. Dovetail anchor slots: AA wire product AA100 or an approved equal.
 4. Dovetail anchors: AA wire product AA200 (3/16-inch wire tie, galvanized) or an approved equal.
 5. Adjustable ties: AA wire product AA302 or an approved equal.
- B. Steel Reinforcing Bars: ASTM A82-76; ASTM A185-73; ASTM A615-76A; ASTM A616-76; ASTM A617-76.
- C. Control Joint: Control joints as indicated on the Drawings and sealed with a material which meets the specifications under Section 07 92 00S and matches the color of the concrete mortar.
1. Concrete masonry unit control joints consisting of either a control block unit or a Michigan type control joint as shown on the Drawings, using 30-pound asphalt saturated felt building paper.
 2. Brick face veneer control joint consisting of a backing rod and waterproof seal as shown on the Drawing with material properties as specified under Section 07 92 00S.
 3. Provide horizontal slip plane, on at least one end of the lintel or both ends of lintel if indicated on Drawings, where reinforced lintel beam terminates at a control joint. Use plastic flashing or bituminous sheets for a slip plane.
 4. Continuous bond beams across control joints. Provide a dummy groove to control location of anticipated crack.
- D. Weep Holes: 3/8-inch diameter nylon rope or sash cord which can be left in place to act as a wick.
- E. Plastic Flashing: 30 mil thick where not exposed, 62 mil where detail exposes part or all of flashing; B.F. Goodrich vinyl water barrier, "Nevastral" or "Nu-Flex" by Sandell Mfg. Co. Use for through wall flashing applications, and elsewhere where flashing is built into concealed masonry.
- F. Metal Tie Bars: Corrosion-resistant rigid steel anchors with a minimum section of 1¼ inches by ¼ inch by 30 inches with 3-inch right angle bends at each end.

- G. Masonry Cell Insulation: Provide rigid, specially shaped, molded-polystyrene insulation units complying with ASTM C578, Type I, designed for installing in cores of masonry units. Install in all exterior CMU units which are not grouted.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Concrete Block Insulating Systems; KORFIL or a comparable product by one of the following:
 - a. Shelter Enterprises Inc.
 2. Physical Properties:
 - a. Typical Density: Minimum 1.05 lbs/cu. ft.
 - b. Thermal Resistance (R-value/inch): 5.00
- H. Cast Stone Units: Comply with ASTM C1364.
1. Trim units including wall caps where indicated on Drawings.
 2. Fabricate units with sharp arris with indicated texture on all exposed surfaces unless otherwise indicated.
 - a. Slope exposed horizontal surfaces 1:12 to drain unless otherwise indicated.
 - b. Provide drips on projecting elements unless otherwise indicated.
 3. Fabrication Tolerances:
 - a. Variation in Cross Section: Do not vary from indicated dimensions by more than 1/8 inch (3 mm).
 - b. Variation in Length: Do not vary from indicated dimensions by more than 1/360 of the length of unit or 1/8 inch (3 mm), whichever is greater, but in no case by more than 1/4 inch (6 mm).
 - c. Warp, Bow, and Twist: Not to exceed 1/360 of the length of unit or 1/8 inch (3 mm), whichever is greater.
 - d. Location of Grooves, False Joints, Holes, Anchorages, and Similar Features: Do not vary from indicated position by more than 1/8 inch (3 mm) on formed surfaces of units and 3/8 inch (10 mm) on unformed surfaces.

4. Cure Units as Follows:
 - a. Cure units in enclosed, moist curing room at 95 percent relative humidity and temperature of 100 deg F (38 deg C) for 12 hours or 70 deg F (21 deg C) for 16 hours.
 - b. Keep units damp and continue curing to comply with one of the following:
 - 1) No fewer than five days at mean daily temperature of 70 deg F (21 deg C) or above.
 - 2) No fewer than seven days at mean daily temperature of 50 deg F (10 deg C) or above.
5. Acid etch units after curing to remove cement film from surfaces to be exposed to view.
6. Colors and Textures: As selected by Engineer from manufacturer's full range.

PART 3: EXECUTION

3.1 ERECTION

- A. General: Accurately cut all reinforcement to length and bent by such methods as will prevent injury to the material. Straighten out all kinks or bends in the bars caused by handling incident to delivery without injury to the material before placing it in the masonry. Wall ties connecting the facing veneer wythe with the backup wythe consisting of prefabricated joint reinforcement.
- B. Metal Ties in Cavity Wall Wythe Construction:
 1. Place prefabricated joint reinforcement in horizontal mortar joints so that longitudinal wires are located over face-shell mortar beds and are fully embedded in mortar for their entire length with minimum mortar cover of 5/8 inch on exterior side of walls and 1/2 inch at other locations. Reinforcement not continuous through a control joint. Do not exceed 16 inches for vertical spacing of the reinforcement. Ties in alternate courses must be staggered. Lap reinforcement 6 inches or more. Install factory fabricated sections at all corners.
 2. For cavity wall construction, one cross wire serving as a tie for not more than each 2 square feet of wall area. Provide additional ties at all openings as indicated on the Drawings.
- C. Steel Reinforcing Bars: Position reinforcement bars accurately at locations shown on the Drawings. Support and secure vertical and horizontal bars against displacement

prior to grouting by wire positioners or other suitable devices at intervals not exceeding 200 bar diameters nor 10 feet. Provide required cover and bar lap as indicated in these Specifications.

1. Splices may be made only at such points and in such manner that the structural strength of the member will not be reduced. Lapped splices to provide sufficient lap to transfer the working stress of the reinforcement by bond and shear.
 - a. Minimum lap: 48 bar diameters, but not less than 24 inches.
 2. Place reinforcement bars prior to grouting.
 3. Completely grout cells containing vertical or horizontal reinforcement bars or dowels in accordance with Section 04 05 16S of these Specifications.
 4. Tolerances for the placement of steel bars in walls and flexural elements: plus or minus ½ inch for "d" equal to 8 inches or less, plus or minus 1 inch for "d" equal to 24 inches or less but greater than 8 inches, and plus or minus 1-1/4 inches for "d" greater than 24 inches. Where "d" is equal to the distance from the top of the grouted masonry beam or face of masonry unit to the center of the steel.
 5. Tolerance for longitudinal location of reinforcement: plus or minus 2 inches.
- D. Protection for Reinforcement: Completely embed all bars and joint reinforcing in mortar or grout. Reinforcement coverage of masonry not less than:
1. 3 inches for bottom of footings.
 2. 2 inches on vertical members where masonry is exposed to action of weather or soil for bars larger than 5/8 inch and 1½ inches for bars 5/8 inch or less.
 3. 3/4 inch from the faces of all walls not exposed to action of weather or soil.
 4. 1-bar diameter over all bars, but not less than 3/4 inch at the upper faces on any member, except where exposed to weather or soil in which cases the minimum coverage shall be 2 inches or 3 inches, respectively.
 5. Reinforcement consisting of bars or wire 1/4 inch or less in diameter embedded in the horizontal mortar joints: not less than 5/8 inch mortar coverage at exposed face of wall.
 6. Thickness of grout or mortar between masonry units and reinforcement: not less than ¼ inch and No. 6 gage or smaller wires may be laid in 3/8 inch horizontal joints.

- E. Control Joints: Do not place control joints through bond beams, unless indicated on Drawings. Rake control joints out $\frac{3}{4}$ inch and leave ready for sealing.
- F. Weep Holes: Place weep holes in a head joint of the outer wythe immediately above the flashing and space 16 inches on center with rope or sash cord extending out $\frac{1}{2}$ inch beyond the exterior face.
- G. Plastic Flashing: Extend flexible flashing $\frac{1}{2}$ inch beyond outside of shelf angle or masonry veneer wythe to form a drip. Cut flashing leaving an exposed uniform line of flashing.
 - 1. Where flashing is to be continuous, all lapped joints at the end of sections must be thoroughly sealed with the proper adhesive per manufacturer's recommendation. At heads of masonry openings, carry head flashing at least 6 inches beyond ends of shelf angle and turn up ends 4 inches minimum to form an end-dam at the masonry head joint, with corners folded, not cut.
 - 2. Reseal penetration of the flashing, either unintentionally or to accommodate a shelf angle bolt, nut, or metal tie, per manufacturer's recommendation, to prevent water passage.
 - 3. Attach flashing to masonry with an aluminum termination bar.
- H. Steel Anchor Bars: 4-foot o.c. vertically at wall intersections.
- I. Set cast-stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.
 - 1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
 - 2. Allow cleaned surfaces to dry before setting.
 - 3. Wet joint surfaces thoroughly before applying mortar.
 - 4. Rake out mortar joints for pointing with sealant.

3.2 FIELD QUALITY CONTROL

- A. Establish and maintain quality control for Work covered under this Section of the Specifications to assure compliance with Contract documents and maintain records of quality for all operations.

END OF SECTION 04 05 23S

SECTION 04 22 00S

CONCRETE UNIT MASONRY

Delete Standard Specification 04 22 00 CONCRETE UNIT MASONRY in its entirety and replace it with the following.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Unit masonry

1.2 RELATED SECTIONS

- A. Section 03 20 00S Concrete Reinforcement
- B. Section 04 05 13S Mortar
- C. Section 04 05 16S Masonry Grout
- D. Section 04 05 23S Masonry Accessories

1.3 REFERENCES

- A. Current editions of the following standards and publications.
 1. ASTM C33/C33M, Standard Specifications for Concrete Aggregates
 2. ASTM C90, Standard Specification for Loadbearing Concrete Masonry Units
 3. ASTM C140/C140M, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
 4. ASTM C216, Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)
 5. ASTM E447-74, Standard Test Methods for Compressive Strength Of Masonry Prisms

6. TMS 402/602 Building Code Requirements and Specifications for Masonry Structures
7. OSHA U.S. Occupational Safety and Health Administration, Section 1926.700(a)

1.4 SUBMITTALS

A. Product Data

1. Manufacturer's specifications and product information for each type of concrete masonry and brick veneer unit proposed, prior to start of masonry work.
2. Include manufacturer's test data indicating the net area compressive strength of concrete masonry units as determined in accordance with ASTM C140/C140M.

B. Samples

1. Reduced size samples of manufacturer's full range of colors available for the concrete masonry units, for initial selection.
2. Full size samples of selected color units for confirmation by Engineer and Owner.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Protect concrete masonry units and clay brick against the elements, wetting and other damage prior to use.
- B. Stockpile concrete block and clay brick on supports free from contact with the ground and cover with a waterproof covering. Masonry units to be free from soil, ice and frost when laid in the wall.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Follow recommended practice set forth by the TMS 402/602

PART 2 PRODUCTS

2.1 MATERIALS

- A. Concrete Block: ASTM C33/C33M



1. Of the size shown on the Contract Drawings and normal weight, with sand and gravel aggregate, conforming to the latest.
 - a. Units to include color additive integral with the block.
2. Hollow concrete block: ASTM Designation C90, Grade N (exposed to moisture penetration or weather), Type 1 (moisture controlled units).
 - a. Specified compressive strength of masonry f'_m : greater than or equal to 2,800 psi.
3. Each unit to be produced by the same manufacturer and of uniform size, shape, color and texture for each continuous area and visually related areas. Do not utilize irregular, unsound or broken units.
4. Size: Manufacturer's standard units with nominal face dimensions of 16 inches long x 8 inches high (15-5/8 inches by 7-5/8 inches actual), with a nominal width as indicated on the Drawings. Additionally, provide units with nominal face dimensions of 16 inches long x 4 inches high (15-5/8 inches by 3-5/8 inches actual) with nominal width at selected locations indicated on the Drawings.
5. Special Shapes: Provide where indicated and where required for bond beams, lintels, corners, jambs, control joints, and other special conditions. Utilize corner blocks and other standard shapes as necessary so that walls will be smooth and free of voids and depressions. Where horizontally reinforced masonry beams, bond beams and lintels are indicated on Drawings, provide special formed U-shaped masonry units or knock-out bond beams as required. Provide for reinforcement at the indicated locations and continuous grout fill of indicated depth.
6. Water Permeance of Masonry: Use water-repellent admixture capable of providing masonry assembly performance of no visible dampness on back of the three wall specimens when evaluated using ASTM E514. Rheopel Series admixtures manufactured by BASF Corporation – Admixture Systems is acceptable when used in accordance with the manufacturer's recommendations. Other systems may be used with OWNER's approval.
7. Curing: Cure units in an autoclave at normal pressure and temperature.
8. Weight Classification: Normal weight units unless otherwise indicated, oven dry weight of concrete of 125 pounds per cubic foot or more.
9. Pattern and Texture: Standard pattern, ground-face finish and Standard pattern, split-face finish at locations as shown on the Contract Drawings.

- B. Mortar: Section 04 05 13S
- C. Grout: Section 04 05 16S
- D. Masonry Accessories: Section 04 05 23S

PART 3 EXECUTION

3.1 ERECTION

- A. General: Concrete masonry units to be dry when laid. Lay all masonry in running bond unless otherwise indicated on the Drawings. Adjust each unit to final position in the wall while mortar is still soft and plastic. Remove and re-lay any unit disturbed after mortar has stiffened with fresh mortar. Align vertical cells to be filled with grout to provide a continuous unobstructed opening of the dimensions shown. Chases to be built in and not cut in. Chases to be plumb and minimum one-unit length from jambs of openings. Install anchor bolts, weep holes, accessories and other items to be built-in as the masonry work progresses.
 - 1. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and properly located openings, movement-type joints, returns and offsets. Do not use units of less-than-half-size unit length except as may be required at wall corners and openings provided the masonry unit coursing was accurately installed.
 - 2. Cut units as required to provide pattern indicated on Drawings and to fit adjoining work neatly. Utilize full units without cutting wherever possible. Cut masonry units with saw designed to cut masonry to provide clean, sharp, unchipped edges.
 - 3. In exposed work, do not utilize masonry units with chips, cracks, voids, discolorations, or other defects which may be visible or cause staining in the finished work.
 - 4. Support masonry bond beams by shoring or an adequate bracing system for a minimum of 7 days after grouting.
 - 5. Do not remove forms and shores until reinforced masonry members have cured sufficiently to carry their own weight and other loads that may be placed on them during construction.
 - 6. Wall Intersections: Place steel tie bar shall in accordance with Section 04 05 23S of these Specifications; or place joint reinforcement, strips of metal lath, or ¼-inch mesh galvanized hardware cloth across the joint between the two walls in

alternating courses. Fill the appropriate cores with mortar or grout to embed the tie bar or selected reinforcement type. Metal lath may be placed under the cores to support the filling.

7. Stopping and Resuming Work: Rake back 1/2 masonry unit length in each course. Clean exposed surfaces of set masonry and remove loose masonry units and mortar prior to laying fresh masonry.

B. Mortar: Section 04 05 13S

C. Grout: Section 04 05 16S

D. Tolerances for Concrete Masonry Construction Based on Actual Dimensions:

Variation from the Plumb:

1. In the lines and surfaces of columns, walls and arises
 - a. In 10 feet - 1/4 inch
 - b. In any story or 20 feet maximum - 3/8 inch
 - c. In 40 feet or more - 1/2 inch
2. For external corners, control joints and other conspicuous lines
 - a. In any story or 20 feet maximum - 1/4 inch
 - b. In 40 feet or more - 1/2 inch

Variation from the Level or the Grades Indicated on the Drawings:

1. For exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines
 - a. In any bay or 20 feet maximum - 1/4 inch
 - b. In 40 feet or more - 1/2 inch

Variation of the Linear Building Lines from Established Position in Plan and Related Portion of Columns, Walls and Partitions:

1. In any bay or 20 feet maximum - 1/2 inch
2. In 40 feet or more - 3/4 inch

Variation in Cross-Sectional Dimensions of Columns and in the Thickness of Walls:

1. Minus 1/4 inch; plus 1/2 inch
- E. Anchorage: Anchor precast planks, steel shelf angles, and wood nailers to the concrete masonry walls as shown on the Contract Drawings.
1. Locate anchor bolts embedded in masonry as indicated on the Drawings. Field drill masonry blocks which require anchor bolts to pass through face shells to the corresponding bolt diameter plus 1/8-inch. Use rigid templates to hold the anchor bolts at the required spacing and location shown on the Contract Drawings during grouting. Prior to grout pour, place templates and rigidly attach. Do not use expansion anchors in any masonry.
- F. Protection of Masonry: When rain or snow is imminent and work is discontinued, cover the tops of exposed masonry walls with a well secured, nonstaining, waterproof cover. Extend membrane at least 2 feet down both sides of wall and anchor securely in place. CONTRACTOR is responsible for following applicable OSHA standards for providing temporary shoring and bracing for masonry walls until the designed lateral strength is reached, to prevent collapse due to wind or other force. Where necessary, temporarily brace foundation walls to prevent damage from backfilling operations.
- G. Embedments and Accessories: Install all anchors, ties, steel reinforcement, anchor bolts, metal frames and other similar items as the work progresses. Solidly fill door frames with mortar as the laying of block progresses. Place sealant around all door frames and where noted on the Contract Drawings.
- H. Reinforcing Bars: See Section 03 20 00S.
- I. Building Insulation: At cavity wall locations, firmly attach board insulation to the masonry backup wall as shown on the Contract Drawings.
- J. Built-In Work: As work progresses, built-in items indicated on the Drawings and items in this and other sections of Contract Documents.
1. Cut units as required to build in conduits, switch boxes, grounds, anchors, nailing strips, plumbing fixtures, mechanical and electrical systems, pipes, brackets, and accessories. Form chases, slots, cut outs, and patch masonry work as required by other trades. Set bucks, blocking and anchoring as required for accurate installation.
 2. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core to fill voids.
 3. Fill space between hollow metal frames and masonry solidly with mortar.

4. Fill cores with grout three (3) courses, or 24 inches, under bearing plates, beams, lintels, posts, and similar conditions unless otherwise indicated on Drawings.
- K. Finish: At completion of the Work, point all holes and defective mortar joints where necessary as covered in Specification Section 04 05 13S.
1. Thoroughly clean exposed masonry. Before applying any cleaning agent to entire wall, apply to sample wall area of approximately 20 s.f. in approved location. Do not proceed with cleaning work until sample area is approved. Use approved cleaning material, method on remaining wall area.
 2. Remove "problem" stains as follows with the as-specified formulations of Pro So Co., Inc.:
 - a. Green Efflorescence - "No. 800 Stain Remover"
 - b. Tar, Asphalt - "Asphalt and Tar Remover"
 - c. Ferrous Stains - "Ferrous Stain Remover"
 - d. Do not use acid solutions for cleaning masonry units unless specifically approved by Architect.
 - e. Clean off loose mortar, remove stains from concrete masonry units.

3.2 FIELD QUALITY CONTROL

- A. Masonry Testing: If requested by the OWNER, build, at CONTRACTOR's expense, three sets of prisms, in accordance with ASTM E447-84, Part 5, Test Specimen, to be tested in a laboratory at Owner's expense. Construct the prisms during construction of the masonry work. Cure the prisms for 28 days and test in accordance with the latest ASTM Designation C140.
1. Compressive strength calculated by dividing the test load by the net cross sectional area of the prism: at least 1,750 psi.
- B. Establish and maintain quality control for work covered under this Section to assure compliance with the Contract Documents and maintain records of CONTRACTOR's quality for all operations including, but not limited to, the following:
1. Records of the location, dimensions and the quantity of block placed.

END OF SECTION 04 22 00S

SECTION 05 12 00S
STRUCTURAL STEEL FRAMING

Delete Standard Specification 05 12 00 STRUCTURAL STEEL FRAMING in its entirety and replace it with the following.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Structural steel
- B. Steel fabrication
- C. Connection design requirements

1.2 RELATED SECTIONS

- A. Section 03 30 04S – Cast-In-Place Concrete
- B. Section 03 61 00S – Grouting
- C. Section 05 50 00S – Metal Fabrications

1.3 REFERENCES

- A. Current editions of the following standards and publications.
 - 1. ASTM A36/A36M, Standard Specification for Carbon Structural Steel
 - 2. ASTM A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless
 - 3. ASTM A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
 - 4. ASTM A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - 5. ASTM A153/A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware [ss]

6. ASTM A240/A240M, Standard Specification for Chromium and Chromium Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications [ss]
7. ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
8. ASTM A490, Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength
9. ASTM A563, Standard Specification for Carbons and Alloy Steel Nuts
10. ASTM A572/A572M, Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
11. ASTM A588/A588M, Standard Specification for High-Strength Low-Alloy Structural Steel, up to 50 ksi [345 MPa] Minimum Yield Point, with Atmospheric Corrosion Resistance
12. ASTM A673/A673M, Standard Specification for Sampling Procedure for Impact Testing of Structural Steel
13. ASTM A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
14. ASTM A992/A992M, Standard Specification for Structural Steel Shapes
15. ASTM A500, Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS)
16. ASTM F1554, Standard Specification for Anchor Bolts, Steel, 36, 55, and 105 KSI Yield Strength
17. ASTM F3125, Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength
18. ASTM F436, Standard Specification for Hardened Steel Washers
19. ASTM F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
20. ASTM F594, Standard Specification for Stainless Steel Nuts
21. ANSI B18.2.2, Specification for Square and Hex Nuts

22. ASTM F959, Standard Specification for Compressible Washer Type Direct Tension Indicators for Use with Structural Fasteners
23. ANSI/AISC 360, Specification for Structural Steel Buildings
24. AISC 303, Code of Standard Practice for Steel Buildings and Bridges
25. AISC, Steel Construction Manual, fifteenth edition
26. AWS D1.1, Structural Welding Code – Steel
27. AWS A2.4, Symbols for Welding, Brazing, and Nondestructive Examination
28. Research Council on Structural Connections (RCSC), Specification for Structural Joints Using ASTM F3125, A325, or A490 Bolts
29. International Building Code 2018 (IBC 2018)
30. Provo City Building Code

1.4 SUBMITTALS

A. Shop and Erection Drawings

1. Show all working points indicated on the Drawings.
2. Provide information necessary for the fabrication of the component parts of the structure.
 - a. ASTM material designation
 - b. Size and weight of members
3. Connections (Shop and Field)
 - a. Type
 - b. Location
 - c. Details
 - d. Welding
 - 1) Type and size of electrodes
 - 2) Extent of welds

- 3) Welding sequence when required
- 4) Welding symbols: AWS A2.4
- e. Shop-bolted connections: submit fabricator's program of quality control that identifies:
 - 1) Installation and tightening procedures
 - 2) Inspection and method of confirmation that bolts have been tightened to the specified tension

B. Connection Design

1. Computations
2. Designed and certified by Professional Engineer registered in Utah

C. Certifications

1. Structural steel: mill test reports
2. High strength bolts: mill test reports (manufacturer's inspection certificate)
3. Certifications for welders employed on the Work

1.5 QUALITY ASSURANCE

A. Qualifications of Suppliers and Personnel

1. Fabricator minimum experience: 5 years continuous in the fabrication of structural steel.
 - a. Maintain a documented quality control program conforming to AISC 360-16, "Specification for Structural Steel Buildings" and AISC 303-16, "Code of Standard Practice for Steel Buildings and Bridges."
 - b. A qualified fabricator who participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant Fabricator.
2. Erector minimum experience: 5 years continuous in the erection of structural steel.
 - a. A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector.

- b. Welder qualifications: passed qualification tests, in accordance with the requirements of AWS “Structural Welding Code” (D1.1), within 6 months prior to start of fabrication.

B. Materials

- 1. For fasteners to be accepted, certification numbers must appear on the product containers and correspond to identification numbers on mill test reports (manufacturer’s inspection certificate).
- 2. Manufacturer’s symbol and grade markings must appear on all bolts and nuts.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect structural steel during fabrication, delivery, and unloading. Store clear of ground and in a manner to eliminate excessive handling and protect from rusting and other damage.
- B. Replace or repair bent or deformed members as directed by Owner.

PART 2 PRODUCTS

2.1 STRUCTURAL SHAPES AND SECTIONS

- A. W shapes: ASTM A992/A992M, $F_y = 50$ ksi
- B. M, S, C, and MC shapes: ASTM A36, $F_y = 36$ ksi
- C. Square and Rectangular HSS shapes: ASTM A500, Grade B, $F_y = 50$ ksi
- D. Round HSS shapes: ASTM A500, Grade B, $F_y = 50$ ksi (round)
- E. Pipes: ASTM A53, Grade B, Schedule 40, $F_y = 35$ ksi

2.2 STEEL PLATES AND BARS: ASTM A36, $F_y = 36$ KSI

2.3 FASTENERS

- A. High strength bolts: ASTM F3125 A325, Type 1, Hot Dipped Galvanized
- B. Nuts: ASTM A563, heavy hex, Grade C, Hot Dipped Galvanized



- C. Washers: ASTM F436, Hot Dipped Galvanized
- D. Stainless steel bolts, nuts, and washers: ASTM F594 with chemical composition of AISI 304 and meeting dimensional requirements of ANSI B18.2.2, stud material. [ss]
 - 1. Washers: AISI 304 stainless steel conforming to ASTM A240, stud material. [ss]
- E. Compressible-Washer-Type Direct Tension Indicator: ASTM F959
- F. Common bolts (other than high strength): ASTM A307, Grade B, Hot Dipped Galvanized
- G. Threaded Rods: ASTM A36, Hot Dipped Galvanized
- H. Shear Stud Connectors: ASTM A108
- I. Concrete fasteners:
 - 1. Adhesive Anchors: Hilti HVA capsule adhesive anchoring system with a stainless HAS rod which meets the requirements of ASTM F593 (304/316) or approved equal.
 - 2. Mechanical Anchors: Hilti Ultimate Kwik Bolt KB-TZ-2 or Hilti KH-EX Concrete screw anchor or approved equal.
 - 3. Cast-in-place Anchors: Anchor rods ASTM F1554 Grade36 with heavy hex nuts.

2.4 FILLER MATERIAL FOR WELDED CONNECTIONS

- A. Filler material for welding A36: minimum tensile strength of 70,000 psi (E70XX electrodes) unless noted otherwise on the Drawings.
- B. Filler material for welding grades of steel other than A36: AWS D1.1.

2.5 CONNECTION DESIGN REQUIREMENTS

- A. General
 - 1. Design, detail, and fabricate according to the AISC, “Steel Construction Manual” for the indicated loading shown on the Drawings or the minimum loading indicated below.
 - 2. Typical Bolt: 7/8” diameter, N: Bearing-type connection, with standard holes, Unless Noted Otherwise (U.N.O.).
 - 3. Minimum gusset plate size: 3/8”

4. Minimum number of bolts: 2, U.N.O.
- B. Where forces are indicated on Drawings
1. Forces correspond with ASD (Allowable Strength Design) or LRFD (Load Resistance Factor Design) load combinations.
 2. Tensile forces are designated as positive numbers.
 3. Compressive forces are designated as negative numbers.
- C. Where forces are not shown on Drawings
1. Vertical bracing end connections
 - a. Axial Force: \pm 24 kips minimum
 2. Horizontal end bracing connections
 - a. Axial Force: \pm 12 kips minimum
 3. Struts or Beams on frame lines
 - a. Axial Force: \pm 12 kips minimum
 4. Beam shear (end) connections
 - a. AISC Table 10-2, Bolted/Welded Double-Angle Connection, Case 1
 - b. Minimum Angle Thickness: 5/16"
 - c. Minimum Weld Size: 1/4"

2.6 FABRICATION

- A. Shop Fabrication and Assembly
- B. Structural steel items: fabricated from standard rolled structural shapes, bars, and plates in accordance with AISC 303, "Code of Standard Practices for Steel Building and Bridges" and approved Shop Drawings.
1. Members and sub-assemblies: fabricated in the largest possible pieces to minimize field erection time.
 2. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

3. Properly mark and match-mark materials for field assembly and for identification as to structure and Site for which intended. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.
4. Where finishing is required, complete the assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in the final structure free of markings, burrs, and other defects.

C. Shop Connections

1. Welded or bolted.
2. Welded construction: Comply with AWS Code for procedures, appearance, quality of welds, and methods used in correcting welded work.
3. Assemble and weld built-up sections by methods that will produce true alignment of axes without warp.

D. Surface Coatings

1. Hot dipped galvanized: ASTM A123

PART 3 EXECUTION

3.1 ERECTION

- A. Structural steel: per the approved Erection Drawings and AISC 303, “Code of Standard Practices for Steel Building and Bridges.”
- B. Provide all erecting tools, hoisting equipment, erection bolts, shims, scaffolding, supports, temporary bracing, guys, bolts, and all other items needed for the complete erection of the steelwork.
- C. Erect accurately to the lines and levels shown on the Drawings. Plumb all columns and other vertical members. Level horizontal members before permanent connections are made.
- D. Bolt up work, as erection progresses, to take care of all dead load and erection stresses.
- E. Provide temporary floors and railings which meet the requirements of state and federal safety regulations.
- F. Handle in such a manner as to minimize damage to finished paint, by using nylon slings, chokers, or other protective lifting devices as required.

- G. Drill all holes not provided in the fabrication and required for erection. Burning of holes is not permitted.
- H. Field cutting structural steel members in the field will not be allowed unless approved by Owner.
- I. Grout under column base plates in accordance with Section 03 61 00S.
- J. Anchor rods in accordance with Section 03 30 04S.

3.2 HIGH STRENGTH BOLTED CONNECTIONS

- A. Install and inspect high strength bolts in accordance with the RCSC, “Specification for Structural Joints Using ASTM F3125 A325 Bolts or A490 Bolts.”
 - 1. High strength bolted connections: Bearing type.
 - 2. Install high strength bolts in properly aligned holes and tighten by “Turn of the Nut” or “Direct Tension Indicator (DTI)” method to the following minimum bolt tensions:

Bolt Diameter (inches)	A325 Bolts Minimum Tension (KIPS)
5/8	19
3/4	28
7/8	39

- 3. Use hardened washers with high strength bolts. Use bevel washers against all sloping flanges.
- B. Accurately fit up bolted field connections before bolts are tightened. Drifting only will bring the parts into position and not sufficient to enlarge the hole or to distort the metal. Drill or ream all unfair holes. No daylight between connected members.
- C. Immediately report to Owner any error in shop work that prevents the proper assembly and fitting up of parts by the moderate use of drift pins, or by a moderate amount of reaming, or by slight chipping or cutting.

3.3 FIELD WELDING

- A. Field welding on structural members only permitted where shown on the Drawings.
- B. Obtain written approval of Owner for undetailed field welded connections.



- C. No welding when the ambient temperature is lower than 0 degrees F (minus 18 degrees C), when surfaces are wet or exposed to rain, snow, or high wind velocities, or when welding personnel are exposed to inclement conditions.
 - 1. Preheat and interpass temperatures: Not less than those listed in AWS D1.1.
- D. Install shear stud connectors per AWS D1.1.
- E. After welding is complete, remove all excess weld materials and scale by grinding, chipping, or brushing, and leave welded areas in smooth, clean, acceptable condition.

3.4 FIELD TOUCH UP

- A. Restore finishes damaged during installation and construction.
- B. Painted Surfaces: After steel erection is complete, clean and touch-up all shop-coated surfaces damaged during transportation and erection.
- C. Galvanized Surfaces:
 - 1. Repair galvanized surfaces damaged by transport, erection, welding, or other operations
 - 2. Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780
- D. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.

3.5 QUALITY CONTROL

- A. Contractor is responsible for visual inspection of all welds and necessary correction of all deficiencies in materials and workmanship in accordance with AWS D1.1.
- B. Owner reserves the right to have any and all shop- and field-welded and high strength bolted connections tested to ensure compliance with the Drawings and Specifications.
- C. Tests will be paid for by Owner; however, in the event that Work is defective, Contractor to pay for the tests and any additional testing required to confirm that the defective Work has been corrected by Contractor to comply with this Specification.

END OF SECTION 05 12 00S

SECTION 05 50 00S
METAL FABRICATIONS

Delete Standard Specifications 05 51 00 METAL STAIRS, and 05 53 00 GRATING AND FLOOR PLATES in their entirety and replace them with the following

PART 1: GENERAL

1.1 SECTION INCLUDES

- A. Miscellaneous stairs
- B. Ladders
- C. Handrails
- D. Grating

1.2 RELATED SECTIONS

- A. Section 03 30 04S – Cast-in-Place Concrete
- B. Section 05 12 00S – Structural Steel Framing

1.3 REFERENCES

- A. Current editions of the following standards and publications.
 - 1. ASTM A36/A36M, Standard Specification for Carbon Structural Steel
 - 2. ASTM A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless
 - 3. ASTM A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
 - 4. ASTM A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - 5. ASTM A153/A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

6. ASTM A240/A240M, Standard Specification for Chromium and Chromium Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
7. ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
8. ASTM A563, Standard Specification for Carbons and Alloy Steel Nuts
9. ASTM A572/A572M, Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
10. ASTM A780/A780M, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
11. ASTM A992/A992M, Standard Specification for Structural Steel Shapes
12. ASTM A500 Grade B, Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS)
13. ASTM F1554, Standard Specification for Anchor Bolts, Steel, 36, 55, and 105 KSI Yield Strength
14. ASTM F3125, Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength
15. ASTM F436, Standard Specification for Hardened Steel Washers
16. ASTM F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs [ss]
17. ASTM F594, Standard Specification for Stainless Steel Nuts
18. ANSI B18.2.2, Specification for Square and Hex Nuts
19. ANSI/AISC 360, Specification for Structural Steel Buildings
20. AISC 303, Code of Standard Practice for Steel Buildings and Bridges
21. AWS D1.1, Structural Welding Code – Steel
22. AWS A2.4 Standard Symbols for Welding, Blazing, and Nondestructive Examination

23. National Association of Architectural Metal Manufacturers (NAAMM), Heavy Duty Metal Bar Grating Manual
24. International Building Code 2018 (IBC 2018)
25. Provo City Building Codes

1.4 SUBMITTALS

A. Shop Drawings.

1. General: Provide fabrication and installation plans, elevations, sections, details of components, anchorage, and accessory items.
2. Miscellaneous stairs
3. Ladders
4. Handrails
5. Grating

B. Product data

1. Metal bar grating
2. Metal stairs
3. Manufacturer's clips and anchorage devices for gratings

1.5 QUALITY ASSURANCE

A. Qualifications of Suppliers and Personnel

1. Fabricator:
 - a. Minimum experience: 5 years continuous in the fabrication of metal components shown on Drawings.
 - b. Maintain a documented quality control program conforming to AISC 360-16, "Specification for Structural Steel Buildings" and AISC 303-16, "Code of Standard Practice for Steel Buildings and Bridges."
 - c. A qualified fabricator who participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant Fabricator.

- d. Welder qualifications: passed qualification tests, in accordance with the requirements of AWS, “Structural Welding Code” (D1.1), within 6 months prior to start of fabrication.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect metal components during fabrication, delivery, storage, and handling to minimize scratches, bends, warping, or other damage.
- B. Use nylon slings, chokers, or other protective lifting devices as required.
- C. Store above ground on level timbers or other material which will not stain, corrode, scratch, or damage the components.

PART 2: PRODUCTS

2.1 MATERIALS

- A. Structural Shapes and Sections
 - 1. W shapes: ASTM A992/A992M, $F_y = 50$ ksi
 - 2. M, S, C, and MC shapes: ASTM A36/A36M, $F_y = 36$ ksi
 - 3. Square and Rectangular HSS shapes: ASTM A500, Grade B, $F_y = 50$ ksi
 - 4. Round HSS shapes: ASTM A500, Grade B, $F_y = 50$ ksi (round)
 - 5. Pipes: ASTM A53/A53M, Grade B, Schedule 40, $F_y = 35$ ksi
 - 6. Steel plates and bars: ASTM A36/A36M, $F_y = 36$ ksi
- B. Stainless steel: AISI Type 304 [ss]
- C. Fasteners
 - 1. Bolts: ASTM A307, Grade B or ASTM F3125 A325 Type 1, Hot Dipped Galvanized
 - 2. Nuts: ASTM A563, heavy hex, Grade C, Hot Dipped Galvanized
 - 3. Washers: ASTM F436, Hot Dipped Galvanized
 - 4. Stainless steel bolts, nuts, and washers: ASTM F594 with chemical composition of AISI 304 and meeting dimensional requirements of ANSI B18.2.2, stud material. [ss]

- a. Washers: AISI 304 stainless steel conforming to ASTM A240/A240M, stud material. [ss]
5. Threaded Rods: ASTM A36/A36M, Hot Dipped Galvanized
6. Shear Stud Connectors: ASTM A108
7. Concrete fasteners:
 - a. Adhesive Anchors: Hilti HVA capsule adhesive anchoring system with a stainless HAS rod which meets the requirements of ASTM F593 (304/316) or approved equal.
 - b. Mechanical Anchors: Hilti Ultimate Kwik Bolt KB-TZ-2 or Hilti KH-EX Concrete screw anchor or approved equal.
 - c. Cast-in-place Anchors: Anchor rods ASTM F1554, Grade36 with heavy hex nuts, .
- D. Stair treads: Serrated grating with checkered plate nosing, hot-dipped galvanized.
- E. Heavy Duty Serrated Grating
 1. Standard marking system: W-22-4 (1½ x ¼)
 2. Material: hot-dipped galvanized steel
- F. Self-closing safety gates
 1. Location: all ladders
 2. Finish: Galvanized with safety yellow finish coat
 3. Manufacturers:
 - a. PS Doors, Grand Forks, ND
 - b. Fabenco, Houston, TX
 - c. Approved Equal
- G. Surface Coatings
 1. Hot dipped galvanized: ASTM A123/A123M

2.2 FABRICATION

- A. General: fabricated in accordance with the Drawings
- B. Steel ladders and stairs
 - 1. Members: straight with no bends or kinks
 - 2. Cut with shears, mechanically-guided torches capable of forming smooth cut or hand-guided torches
 - 3. Exposed or visible surfaces: grind smooth
 - 4. Exposed edges and corners: machine fillet or chamfer
- C. Handrails
 - 1. Cut, reinforce, drill, and tap components, as indicated, to receive finish hardware, screws, and similar items.
 - 2. Provide weep holes or another means to prevent entrapped water in hollow members that are exposed to moisture from condensation or other sources.
 - 3. Provide water tight joints for members exposed to weather.
 - 4. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated.
 - 5. Provide toe boards at railings around openings and at the edge of open-sided floors and platforms.
 - 6. Shear and punch metals cleanly and accurately. Remove burrs from exposed cut edges.
 - 7. Protect finishes of handrails and railing systems from damage during construction period with temporary protective coverings approved by railing manufacturer.
- D. Grating
 - 1. Anchorage: per manufacturer's recommendations.
 - 2. Fabricate and space anchoring devices to secure gratings, frames, and supports rigidly in place and to support loads.
 - 3. Outline all removable grating panels with 6-inch-wide yellow epoxy paint.

- E. Welded construction: Comply with AWS Code for procedures, appearance, quality of welds, and methods used in correcting welded work.
- F. Finish: Provide surface finish after fabrication.

PART 3: EXECUTION

3.1 ERECTION

- A. General: Erect plumb, horizontal or at the designated slope, and square
- B. Steel ladders and stairs: in accordance with Section 05 12 00S
- C. Anchor rods: in accordance with Section 03 30 04S
- D. Handrails
 - 1. Installed in accordance with the details shown on the Drawings
 - 2. Vertical components of handrails to be plumb and horizontal components to be parallel to the walls
 - 3. Provide expansion joints to accommodate thermal movement.
 - a. Provide slip-joint internal sleeve extending 2 inches beyond the joint on each side, fasten internal sleeve securely to one side and locate joint within 6 inches of post.
- E. Remove protective coverings at completion of work.
- F. Gratings
 - 1. Installation clearances: per manufacturers' recommendations and NAAMM
 - 2. Secure non-removable and removable units to supporting members with type and size of clips and fasteners as recommended by manufacturer.

3.2 FIELD TOUCH UP

- A. Restore finishes damaged during installation and construction.
- B. Painted Surfaces: After steel erection is complete, clean and touch-up all shop-coated surfaces damaged during transportation and erection.

- C. Galvanized Surfaces:
 - 1. Repair galvanized surfaces damaged by transport, erection, welding, or other operations
 - 2. Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M
- D. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.

3.3 FIELD CONTROL QUALITY

- A. Contractor is responsible for visual inspection of all welds and necessary correction of all deficiencies in materials and workmanship in accordance with AWS D1.1.
- B. Owner reserves the right to have any and all shop- and field-welded and high strength bolted connections tested to ensure compliance with the Drawings and Specifications.
- C. Tests will be paid for by Owner; however, in the event that Work is defective, Contractor to pay for the tests and any additional testing required confirming that the defective Work has been corrected by Contractor to comply with this Specification.

END OF SECTION 05 50 00S

SECTION 06 10 00S
ROUGH CARPENTRY

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wood products.
 - 2. Wood-preservative-treated lumber.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
- B. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
- C. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.3 INFORMATIONAL SUBMITTALS

- A. Material Certificates:
 - 1. For preservative-treated wood products. Indicate type of preservative used and net amount of preservative retained.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS

- A. Lumber: Comply with DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWWA U1, Use categories as follows:
 - 1. UC3A: Coated sawn products in exterior construction exposed to all weather cycles including intermittent wetting. Include the following items:
 - a. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat all rough carpentry unless otherwise indicated.

2.3 MISCELLANEOUS LUMBER

- A. Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Rooftop equipment bases and support curbs.
- B. Dimension Lumber Items: Construction or No. 2 grade lumber of any species.
- C. Roofing Nailers: Structural- or No. 2-grade lumber or better; kiln-dried Douglas fir, southern pine, or wood having similar decay-resistant properties.

- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

2.4 FASTENERS

- A. General: Fasteners are to be of size and type indicated and comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches (38 mm) into wood substrate.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or ASTM F2329.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- C. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- D. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- E. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- F. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.10.1, "Fastening Schedule," in ICC's International Building Code (IBC).
 2. ICC-ES evaluation report for fastener.
- G. Securely attach roofing nailers to substrates by anchoring and fastening to withstand bending, shear, or other stresses imparted by Project wind loads and fastener-resistance loads as designed in accordance with ASCE/SEI 7.
- H. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach wood blocking to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Attach wood roofing nailers securely to substrate to resist the designed outward and upward wind loads indicated on Drawings and in accordance with ANSI/SPRI ED-1, Tables A6 and A7.

END OF SECTION 06 10 00S

SECTION 07 14 16S

COLD FLUID-APPLIED WATERPROOFING

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Polyurethane waterproofing.
 - 2. Protection course.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review waterproofing requirements including, but not limited to, the following:
 - a. Surface preparation specified in other Sections.
 - b. Minimum curing period.
 - c. Forecasted weather conditions.
 - d. Special details and sheet flashings.
 - e. Repairs.
 - f. Field quality control.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
 - 2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.
- B. Shop Drawings:
 - 1. Indicate locations and extent of waterproofing.
 - 2. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Field quality-control reports.
- C. Sample Warranties: For special warranties.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer.
 - 1. Do not apply waterproofing to a damp or wet substrate, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F (3 deg C) above dew point.
 - 2. Do not apply waterproofing in snow, rain, fog or mist, or when such weather conditions are imminent during application and curing period.
- B. Maintain adequate ventilation during application and curing of waterproofing materials.

1.7 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace waterproofing that fails in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain waterproofing materials and protection course from single source and from single manufacturer.

2.2 POLYURETHANE WATERPROOFING

- A. Single-Component, Modified Polyurethane Waterproofing: ASTM C836/C836M and coal-tar free.



1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CETCO is a subsidiary of Minerals Technologies Inc.
 - b. Carlisle Coatings & Waterproofing Inc.
 - c. MAPEI Corporation.
 - d. Master Builders Solutions.
 - e. Neogard; Hempel Group.
 - f. Tremco Incorporated.

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials recommended in writing by waterproofing manufacturer for intended use and compatible with one another and with waterproofing.
 1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.
- B. Primer: Manufacturer's standard primer, sealer, or surface conditioner; factory-formulated.
- C. Sheet Flashing: 50-mil- (1.3-mm-) minimum, nonstaining, uncured sheet neoprene.
 1. Adhesive: Manufacturer's recommended contact adhesive.

2.4 PROTECTION COURSE

- A. Protection Course, Molded-Polystyrene Board Insulation: ASTM C578, Type I, 0.90 lb/cu. ft. (15 kg/cu. m) minimum density, thickness as indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
 2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method in accordance with ASTM D4263.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean, prepare, and treat substrates in accordance with manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, acid residues, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, and other projections, and fill honeycomb, aggregate pockets, holes, and other voids.

3.3 PREPARATION AT TERMINATIONS, PENETRATIONS, AND CORNERS

- A. Prepare surfaces at terminations and penetrations through waterproofing and at expansion joints, drains, sleeves, and corners in accordance with waterproofing manufacturer's written instructions and to recommendations in ASTM C898/C898M.
- B. Apply waterproofing in two separate applications and embed a joint reinforcing strip in the first preparation coat when recommended by waterproofing manufacturer.

3.4 JOINT AND CRACK TREATMENT

- A. Prepare, treat, rout, and fill joints and cracks in substrate in accordance with waterproofing manufacturer's written instructions and to recommendations in ASTM C898/C898M. Before coating surfaces, remove dust and dirt from joints and cracks in accordance with ASTM D4258.
- B. Install sheet flashing and bond to wall substrates where required in accordance with waterproofing manufacturer's written instructions.

3.5 INSTALLATION OF WATERPROOFING

- A. Apply waterproofing in accordance with manufacturer's written instructions and to recommendations in ASTM C898/C898M.
- B. Start installing waterproofing in presence of manufacturer's technical representative.
- C. Apply primer over prepared substrate unless otherwise instructed in writing by waterproofing manufacturer.

- D. Unreinforced Waterproofing Applications: Mix materials and apply waterproofing by spray, roller, notched squeegee, trowel, or other application method suitable to slope of substrate.
 - 1. Apply one or more coats of waterproofing to obtain a seamless membrane free of entrapped gases and pinholes, with a dry film thickness of 60 mils (1.5 mm).
 - 2. Apply waterproofing to prepared wall terminations and vertical surfaces.
 - 3. Verify manufacturer's recommended wet film thickness of waterproofing every 100 sq. ft. (9.3 sq. m).
- E. Cure waterproofing, taking care to prevent contamination and damage during application and curing.
- F. Install protection course with butted joints over waterproofing before starting subsequent construction operations.
 - 1. For vertical applications, set protection course in nominally cured membrane, which will act as an adhesive. If membrane cures before application of protection course, use adhesive.
 - 2. Thermal insulation in place of protection course where shown.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: OWNER will engage a qualified testing agency to perform tests and inspections:
 - 1. Testing agency to verify thickness of waterproofing during application for each 600 sq. ft. (56 sq. m) of installed waterproofing or part thereof.
- B. Manufacturer's Field Service: Engage a site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components and to furnish daily reports to Architect.
- C. Waterproofing will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.7 PROTECTION

- A. Protect waterproofing from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

END OF SECTION 07 14 16S

SECTION 07 21 00S

THERMAL INSULATION

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Extruded polystyrene foam-plastic board insulation.
- B. Related Requirements:
 - 1. Section 04 05 23 "Masonry Accessories" for insulation inserts for CMU.
 - 2. Section 07 14 16 "Cold Fluid-Applied Waterproofing" for foundation insulation.
 - 3. Section 07 53 23 "Ethylene-Propylene-Diene-Monomer (EPDM) Roofing" for insulation specified as part of roofing construction.

1.2 ACTION SUBMITTALS

- A. Product Data:
 - 1. Extruded polystyrene foam-plastic board insulation.

1.3 INFORMATIONAL SUBMITTALS

- A. Installer's Certification: Listing type, manufacturer, and R-value of insulation installed in each element of the building thermal envelope.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Research Reports: For foam-plastic insulation, from ICC-ES.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

- B. Protect foam-plastic board insulation as follows:
- C. Do not expose to sunlight except to necessary extent for period of installation and concealment.
- D. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
- E. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD INSULATION

- A. Extruded Polystyrene Board Insulation, Type VI: ASTM C578, Type VI, 40-psi minimum compressive strength; unfaced.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Dow Chemical Company (The).
 - b. DuPont.
 - c. Kingspan Insulation Limited.
 - d. Owens Corning.
 - 2. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
 - 3. Smoke-Developed Index: Not more than 450 when tested in accordance with ASTM E84.
 - 4. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches (305 mm) and wider in width.
 - 5. Thickness: As indicated on Drawings.
 - 6. Application: Horizontal under-slab insulation.

2.2 ACCESSORIES

- A. Adhesive for Bonding Insulation: Product compatible with insulation and substrate materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF SLAB INSULATION

- A. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.
- B. If not otherwise indicated, extend insulation a minimum of 24 inches (610 mm) in from exterior walls.

3.4 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.
- B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00S

SECTION 07 53 23S

ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING

Add this Supplemental Specification to the Contract Documents..

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Ethylene-propylene-diene-terpolymer (EPDM) roofing.
 2. Accessory roofing materials.
 3. Roof insulation.
 4. Insulation accessories and cover board.
 5. Walkways.

1.2 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

1.3 PREINSTALLATION MEETINGS

- A. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site.
1. Meet with OWNER, ENGINEER, OWNER's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, air barrier Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Review deck substrate requirements for conditions and finishes, including flatness and fastening.
 5. Review structural loading limitations of roof deck during and after roofing.
 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.

7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.4 SUBMITTALS

- A. Product Data:
 1. Ethylene-propylene-diene-terpolymer (EPDM) roofing.
 2. Accessory roofing materials.
 3. Roof insulation.
 4. Insulation accessories and cover board.
 5. Walkways.
- B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:
 1. Layout and thickness of insulation.
 2. Base flashings and membrane terminations.
 3. Flashing details at penetrations.
 4. Tapered insulation, thickness, and slopes.
 5. Roof plan showing orientation of steel roof deck and orientation of roof membrane and fastening spacings and patterns for mechanically fastened roofing system.
 6. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.
- D. Qualification Data: For Installer and manufacturer.
- E. Manufacturer Certificates:
 1. Performance Requirement Certificate: Signed by roof membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - a. Submit evidence of complying with performance requirements.
 2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.
- F. Product Test Reports: For components of roof membrane and insulation, for tests performed by a qualified testing agency, indicating compliance with specified requirements.
- G. Evaluation Reports: For components of roofing system, from ICC-ES.

1. Field Test Reports:
- H. Field quality-control reports.
- I. Sample Warranties: For manufacturer's special warranties.
- J. Maintenance Data: For roofing system to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is listed in FM Approvals' RoofNav for roofing system identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.7 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and warranty requirements.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Special warranty includes roof membrane, base flashings, roof insulation, fasteners, cover boards, and other components of roofing system.
 - 2. Warranty Period: 20 years from Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing system and base flashings to withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and flashings to remain watertight.
 - 1. Accelerated Weathering: Roof membrane to withstand 2000 hours of exposure when tested in accordance with ASTM G152, ASTM G154, or ASTM G155.
 - 2. Impact Resistance: Roof membrane to resist impact damage when tested in accordance with ASTM D3746, ASTM D4272, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
- B. Material Compatibility: Roofing materials to be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.
- C. FM Approvals' RoofNav Listing: Roof membrane, base flashings, and component materials comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system and are listed in FM Approvals' RoofNav for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals Certification markings.
 - 1. Fire/Windstorm Classification: Class 1A-90.
 - 2. Hail-Resistance Rating: FM Global Property Loss Prevention Data Sheet 1-34 SH.

2.2 ETHYLENE-PROPYLENE-DIENE-TERPOLYMER (EPDM) ROOFING

- A. EPDM Sheet: ASTM D4637/D4637M, Type I, nonreinforced, EPDM sheet.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Carlisle Syntec Systems.

- b. Firestone Building Products.
 - c. GenFlex Roofing Systems.
 - d. Johns Manville; a Berkshire Hathaway company.
2. Thickness: 60 mils (1.5 mm), nominal.
 3. Exposed Face Color: Black.
 4. Source Limitations: Obtain components for roofing system from roof membrane manufacturer or manufacturers approved by roof membrane manufacturer.

2.3 ACCESSORY ROOFING MATERIALS

- A. General: Accessory materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.
 1. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: 60-mil- (1.5-mm-) thick EPDM, partially cured or cured, according to application.
- C. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.
- D. Bonding Adhesive: Manufacturer's standard.
- E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening components to substrate, and acceptable to roofing system manufacturer.
- F. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, molded pipe boot flashings, preformed inside and outside corner sheet flashings, reinforced EPDM securement strips, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.

2.4 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by EPDM roof membrane manufacturer and approved for use in FM Approvals' RoofNav-listed roof assemblies.
- B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 2 coated glass-fiber facer on both major surfaces.
 1. Compressive Strength: 20 psi (138 kPa).
 2. Thickness: As required to meet R-value indicated on Drawings.
- C. Tapered Insulation: Provide factory-tapered insulation boards.
 1. Material: Match roof insulation.

2. Minimum Thickness: 1/4 inch (6.35 mm).

2.5 INSULATION ACCESSORIES AND COVER BOARD

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with other roofing system components.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.
- C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- D. Glass-Mat Gypsum Cover Board: ASTM C1177/C1177M, water-resistant gypsum substrate.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Certainteed; SAINT-GOBAIN.
 - b. Gold Bond Building Products, LLC provided by National Gypsum Company.
 - c. USG Corporation.
 2. Thickness: 1/2 inch (13 mm).

2.6 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads or rolls, approximately 3/16 inch (5 mm) thick and acceptable to roofing system manufacturer.
 1. Size: Approximately 36 by 60 inches (914 by 1524 mm).
 2. Color: Contrasting with roof membrane.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.

2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing system installation in accordance with roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 INSTALLATION OF ROOFING, GENERAL

- A. Install roofing system in accordance with roofing system manufacturer's written instructions, FM Approvals' RoofNav assembly requirements, and FM Global Property Loss Prevention Data Sheet 1-29.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.4 INSTALLATION OF INSULATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.
- B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.
 1. Fasten insulation in accordance with requirements in FM Approvals' RoofNav for specified Windstorm Resistance Classification.

3.5 INSTALLATION OF COVER BOARDS

- A. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction.

1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
2. At internal roof drains, conform to slope of drain sump.
 - a. Trim cover board so that water flow is unrestricted.
3. Cut and fit cover board tight to nailers, projections, and penetrations.
4. Loosely lay cover board over substrate.
5. Adhere cover board to substrate using adhesive in accordance with FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29.

3.6 INSTALLATION OF ADHERED ROOF MEMBRANE

- A. Adhere roof membrane over area to receive roofing in accordance with roofing system manufacturer's written instructions.
- B. Unroll membrane roof membrane and allow to relax before installing.
- C. Start installation of roofing in presence of roofing system manufacturer's technical personnel.
- D. Accurately align roof membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- E. In addition to adhering, mechanically fasten roof membrane securely at terminations, penetrations, and perimeters.
- F. Apply roof membrane with side laps shingled with slope of roof deck where possible.
- G. Repair tears, voids, and lapped seams in roof membrane that do not comply with requirements.
- H. Spread sealant or mastic bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.
- I. Adhere protection sheet over roof membrane at locations indicated.

3.7 INSTALLATION OF BASE FLASHING

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates in accordance with roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.

- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.8 INSTALLATION OF WALKWAYS

- A. Flexible Walkways: Install walkway products in accordance with manufacturer's written instructions.
 - 1. Install flexible walkways at the following locations:
 - a. Locations indicated on Drawings.
 - b. As required by roof membrane manufacturer's warranty requirements.
 - 2. Provide 6-inch (76-mm) clearance between adjoining pads.
 - 3. Adhere walkway products to substrate with compatible adhesive in accordance with roofing system manufacturer's written instructions.

3.9 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of ENGINEER, and to prepare inspection report.
- B. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- C. Additional testing and inspecting, at CONTRACTOR's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.10 PROTECTING AND CLEANING

- A. **Protect roofing system from damage and wear during remainder of construction period.** When remaining construction does not affect or endanger roofing system, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to ENGINEER and OWNER.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free

of damage and deterioration at time of Substantial Completion and in accordance with warranty requirements.

- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 53 23S

SECTION 07 62 00S
SHEET METAL FLASHING AND TRIM

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Roof-drainage sheet metal fabrications.
 2. Embedded wall flashing.

1.2 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.3 ACTION SUBMITTALS

- A. Product Data: For each product.
- B. Shop Drawings: For sheet metal flashing and trim.
1. Include plans, elevations, sections, and attachment details.
 2. Include identification of material, thickness, weight, and finish for each item and location in Project.
 3. Include details for forming, including profiles, shapes, seams, and dimensions.
 4. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 5. Include details of connections to adjoining work.
 6. Detail formed flashing and trim at scale of not less than 3 inches per 12 inches (1:5).
- C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

- D. Samples for Verification: For each type of exposed finish.
 - 1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
 - 2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
 - 3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.
- B. Special warranty.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
 - 1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
 - 2. Protect stored sheet metal flashing and trim from contact with water.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.8 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, are to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim are not to rattle, leak, or loosen, and are to remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 SHEET METALS

- A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Aluminum Sheet: ASTM B209 (ASTM B209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.

1. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Color: As selected by ENGINEER from manufacturer's full range.
3. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil (0.013 mm).

2.3 MISCELLANEOUS MATERIALS

- A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- D. Elastomeric Sealant: ASTM C920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Bituminous Coating: Cold-applied asphalt emulsion in accordance with ASTM D1187/D1187M.

2.4 FABRICATION, GENERAL

- A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.
 - 1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 - 2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
 - 4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 - 5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances:
 - 1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
 - 2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
- D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Do not use graphite pencils to mark metal surfaces.

2.5 ROOF-DRAINAGE SHEET METAL FABRICATIONS

- A. Downspouts: Fabricate rectangular downspouts to dimensions indicated on Drawings, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.
 - 1. Fabricate from the following materials:
 - a. Aluminum: 0.024 inch (0.61 mm) thick.

- B. Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch- (100-mm-) wide wall flanges to interior, and base extending 4 inches (100 mm) beyond cant or tapered strip into field of roof. Fabricate from the following materials:
 - 1. Aluminum: 0.032 inch (0.81 mm) thick.
- C. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape required, complete with outlet tubes. Fabricate from the following materials:
 - 1. Aluminum: 0.032 inch (0.81 mm) thick.

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof-Penetration Flashing: Fabricate from the following materials:
 - 1. Stainless Steel: 0.0188 inch (0.477 mm) thick.
- B. Roof-Drain Flashing: Fabricate from the following materials:
 - 1. Stainless Steel: 0.0156 inch (0.396 mm) thick.

2.7 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
 - 1. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.016 inch (0.40 mm) thick.
 - 2. Fabricate metal drip edges from stainless steel. Extend at least 3 inches (76 mm) into wall and 1/2 inch (13 mm) out from wall, with outer edge bent down 30 degrees and hemmed.
 - 3. Fabricate metal sealant stops from stainless steel. Extend at least 3 inches (76 mm) into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch (19 mm) and down into joint 1/4 inch (6 mm) to form a stop for retaining sealant backer rod.
 - 4. Solder metal items at corners.
- B. Flexible Flashing: Use the following unless otherwise indicated:
 - 1. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.030 inch (0.76 mm).
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Advanced Building Products Inc.
 - 2) Carlisle Coatings & Waterproofing Inc.
 - 3) Hohmann & Barnard, Inc.

- 4) Polyguard Products, Inc.
 - 5) W. R. Meadows, Inc.
 - b. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.
- C. Application: Unless otherwise indicated, use the following:
 - 1. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.

2.8 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Equipment Support Flashing: Fabricate from the following materials:
 - 1. Stainless Steel: 0.0188 inch (0.477 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.
 - 1. Install fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure.
 - 3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
 - 5. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.

6. Do not field cut sheet metal flashing and trim by torch.
 7. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of uncoated-aluminum and stainless steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
- D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter.

3.3 INSTALLATION OF ROOF-DRAINAGE SYSTEM

- A. Install sheet metal roof-drainage items to produce complete roof-drainage system in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

3.4 INSTALLATION OF ROOF FLASHINGS

- A. Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard.
1. Provide concealed fasteners where possible, and set units true to line, levels, and slopes.
 2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.5 INSTALLATION OF MISCELLANEOUS FLASHING

- A. Equipment Support Flashing:
 - 1. Coordinate installation of equipment support flashing with installation of roofing and equipment.
 - 2. Weld or seal flashing with elastomeric sealant to equipment support member.

3.6 INSTALLATION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.7 CLEANING

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.

3.8 PROTECTION

- A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.
- C. Maintain sheet metal flashing and trim in clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by ENGINEER.

END OF SECTION 07 62 00S

SECTION 07 72 00S
ROOF ACCESSORIES

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Roof curbs.
 - 2. Equipment supports.
 - 3. Roof hatches.

- B. Related Requirements:
 - 1. Section 076200 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing, and miscellaneous sheet metal trim and accessories.

1.2 COORDINATION

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.

- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

- B. Shop Drawings: For roof accessories.
 - 1. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.

- C. Delegated Design Submittals: For roof curbs and equipment supports indicated to comply with performance requirements and design criteria, including analysis data

signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail mounting, securing, and flashing of roof-mounted items to roof structure. Indicate coordinating requirements with roof membrane system.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
 1. Size and location of roof accessories specified in this Section.
 2. Method of attaching roof accessories to roof or building structure.
 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
 4. Required clearances.
- B. Sample Warranties: For manufacturer's warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.6 WARRANTY

- A. Provide manufacturer's standard 5 year warranty. All roof hatches and smoke vents shall be free from manufacturing defects in materials and workmanship for a period of five (5) years from the date of shipment.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof accessories to withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
 1. Refer to Drawings for wind and snow loads.
- B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design roof curbs and equipment supports to comply with wind performance requirements, including comprehensive engineering

analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

2.2 ROOF CURBS

- A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings, bearing continuously on roof structure, and capable of meeting performance requirements; with welded or mechanically fastened and sealed corner joints, straight sides, and integrally formed deck-mounting flange at perimeter bottom.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. AES Industries, Inc.
 - b. Air Balance; a division of MESTEK, Inc.
 - c. Greenheck Fan Corporation.
 - d. Pate Company (The).
 - e. Thybar Corporation.
- B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.
- C. Supported Load Capacity: Coordinate load capacity with information on Shop Drawings of equipment to be supported.
- D. Steel: Zinc-coated (galvanized) steel sheet, 0.052 inch (1.32 mm) thick.
1. Finish: Mill phosphatized.
- E. Construction:
1. Curb Profile: Manufacturer's standard compatible with roofing system.
 2. Fabricate curbs to minimum height of 12 inches (305 mm) above roofing surface unless otherwise indicated.
 3. Insulation: Factory insulated with 1-1/2-inch- (38-mm-) thick glass-fiber board insulation.
 4. Liner: Same material as curb, of manufacturer's standard thickness and finish.
 5. Nailer: Factory-installed wood nailer along top flange of curb, continuous around curb perimeter.
 6. Platform Cap: Where portion of roof curb is not covered by equipment, provide weathertight platform cap formed from 3/4-inch- (19-mm-) thick plywood covered with metal sheet of same type, thickness, and finish as required for curb.
 7. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as curb.

2.3 EQUIPMENT SUPPORTS

- A. Equipment Supports: Rail-type metal equipment supports capable of supporting superimposed live and dead loads between structural supports, including equipment loads and other construction indicated on Drawings, spanning between structural supports; capable of meeting performance requirements; with welded corner joints, integral metal cant, and integrally formed structure-mounting flange at bottom.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Activar Construction Products Group, Inc. - JL Industries.
 - b. Air Balance; a division of MESTEK, Inc.
 - c. Greenheck Fan Corporation.
 - d. Pate Company (The).
 - e. Thybar Corporation.
- B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.
- C. Supported Load Capacity: Coordinate load capacity with information on Shop Drawings of equipment to be supported.
- D. Steel: Zinc-coated (galvanized) steel sheet, 0.052 inch (1.32 mm) thick.
1. Finish: Mill phosphatized.
- E. Construction:
1. Curb Profile: Manufacturer's standard compatible with roofing system.
 2. Nailer: Factory-installed continuous wood nailers 3-1/2 inches (90 mm) wide on top flange of equipment supports, continuous around support perimeter.
 3. Platform Cap: Where portion of equipment support is not covered by equipment, provide weathertight platform cap formed from 3/4-inch- (19-mm-) thick plywood covered with metal sheet of same type, thickness, and finish as required for curb.
 4. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as equipment support.
 5. Fabricate equipment supports to minimum height of 12 inches (305 mm) above roofing surface unless otherwise indicated.

2.4 ROOF HATCHES

- A. Roof Hatches: Metal roof-hatch units with lids, welded or mechanically fastened and sealed corner joints, continuous counterflashing and weathertight perimeter gasketing, straight sides, and integrally formed deck-mounting flange at perimeter bottom.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Babcock-Davis Equipment Roof Hatch or comparable product by one of the following:

- a. ACUDOR Products, Inc.
 - b. BILCO Company (The).
 - c. Milcor; a division of Hart & Cooley, Inc.
- B. Type and Size:
- 1. Double-leaf or Single-leaf lid, custom size as indicated on Drawings.
- C. Loads: Minimum 40-lbf/sq. ft. external live load and 20-lbf/sq. ft. internal uplift load.
- D. Hatch Material, Aluminum:
- 1. Thickness: Manufacturer's standard thickness for hatch size indicated.
 - 2. Finish: Mill.
- E. Construction:
- 1. Insulation: 1-inch fiberglass in cover.
 - 2. Nailer: Factory-installed wood nailer continuous around hatch perimeter.
 - 3. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
- F. Hardware: Spring operators, hold-open arm, stainless steel spring latch with turn handles, stainless steel butt- or pintle-type hinge system, and padlock hasps inside and outside.
- 1. Provide two-point latch on lids larger than 84 inches.

2.5 METAL MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, G90 (Z275) coating designation and mill phosphatized for field painting where indicated.
- 1. Mill-Phosphatized Finish: Manufacturer's standard for field painting.
- B. Aluminum Sheet: ASTM B209 (ASTM B209M), manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.
- 1. Mill Finish: As manufactured.
 - 2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil (0.013 mm).
- C. Aluminum Extrusions and Tubes: ASTM B221 (ASTM B221M), manufacturer's standard alloy and temper for type of use, finished to match assembly where used; otherwise mill finished.
- D. Steel Shapes: ASTM A36/A36M, hot-dip galvanized according to ASTM A123/A123M unless otherwise indicated.
- E. Steel Tube: ASTM A500/A500M, round tube.

- F. Galvanized-Steel Tube: ASTM A500/A500M, round tube, hot-dip galvanized according to ASTM A123/A123M.
- G. Steel Pipe: ASTM A53/A53M, galvanized.

2.6 MISCELLANEOUS MATERIALS

- A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- C. Underlayment:
 - 1. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils (0.76 to 1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
- D. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:
 - 1. Fasteners for Zinc-Coated or Aluminum-Zinc Alloy-Coated Steel: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A153/A153M or ASTM F2329.
 - 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
- E. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.
- F. Elastomeric Sealant: ASTM C920, elastomeric polyurethane polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.

2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install roof accessories according to manufacturer's written instructions.
 - 1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
 - 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
 - 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.
- C. Roof Curb Installation: Install each roof curb so top surface is level.
- D. Equipment Support Installation: Install equipment supports so top surfaces are level with each other.
- E. Roof-Hatch Installation:
 - 1. Verify that roof hatch operates properly. Clean, lubricate, and adjust operating mechanism and hardware.

2. Attach safety railing system to roof-hatch curb.
 3. Attach ladder-assist post according to manufacturer's written instructions.
- F. Seal joints with elastomeric sealant as required by roof accessory manufacturer.

3.3 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A780/A780M.
- B. Clean exposed surfaces according to manufacturer's written instructions.
- C. Clean off excess sealants.
- D. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 07 72 00S

SECTION 07 84 13S
PENETRATION FIRESTOPPING

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Penetrations in fire-resistance-rated walls.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Listed System Designs: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.4 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Approvals according to FM Approvals 4991, "Approval Standard for Firestop Contractors," or been evaluated

by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain joint firestop systems for each type of joint opening indicated from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
 - 1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Penetration firestop systems installed with products bearing the classification marking of a qualified product certification agency in accordance with listed system designs published by a qualified testing agency.
 - 1) UL in its online directory "Product iQ."

- 2) Intertek Group in its "Directory of Building Products."
- 3) FM Approvals in its "Approval Guide."

2.3 PENETRATION FIRESTOPPING SYSTEMS

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems are to be compatible with one another, with the substrates forming openings, and with penetrating items if any.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. 3M Fire Protection Products.
 - b. Balco; a CSW Industrials Company.
 - c. Grabber Construction Products, Inc.
 - d. Hilti, Inc.
 - e. Specified Technologies, Inc.
 - f. Tremco Incorporated.
- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479.
1. F-Rating: Not less than the fire-resistance rating of the wall penetrated.
 2. Membrane Penetrations: Install recessed fixtures such that the required fire resistance will not be reduced.
- C. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E84.
- D. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.
1. Permanent forming/damming/backing materials.
 2. Substrate primers.
 3. Collars.
 4. Steel sleeves.

2.4 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer sleeve lined with an intumescent strip, a flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.
- E. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.
- F. Intumescent Wrap Strips: Single-component intumescent elastomeric strips for use around combustible penetrants.
- G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- H. Pillows/Bags: Compressible, removable, and reusable intumescent pillows encased in fire-retardant polyester or glass-fiber cloth. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.
- I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants.
- K. Fire-Rated Cable Sleeve Kits: Complete kits designed for new or existing cable penetrations through walls to accept standard accessories.
- L. Thermal Wrap: Flexible protective wrap tested and listed for up to 2-hour fire ratings in accordance with ASTM E814/UL 1479 for membrane penetrations or ASTM E1725/UL 1724 for thermal barrier and circuit integrity protection.
- M. Fire-Rated Cable Pathways: Single or gangable device modules composed of a steel raceway with integral intumescent material and requiring no additional action in the form of plugs, twisting closure, putty, pillows, sealant, or otherwise to achieve fire and air-leakage ratings.
- N. Retrofit Device for Cable Bundles: Factory-made, intumescent, collar-like device for firestopping existing over-filled cable sleeves and capable of being installed around projecting sleeves and cable bundles.

- O. Wall-Opening Protective Materials: Intumescent, non-curing putty pads or self-adhesive inserts for protection of electrical switch and receptacle boxes.
- P. Fire-Rated HVAC Retaining Angles: Steel angle system with integral intumescent firestop gasket for use around rectangular steel HVAC ducts without fire dampers.
- Q. Firestop Plugs: Flexible, re-enterable, intumescent, foam-rubber plug for use in blank round openings and cable sleeves.
- R. Fire-Rated Cable Grommet: Molded two-piece grommet made of plenum-grade polymer and foam inner core for sealing small cable penetrations in gypsum walls up to 1/2 inch (13 mm) diameter.
- S. Closet Flange Gasket: Molded, single-component, flexible, intumescent gasket for use beneath a water closet (toilet) flange in floor applications.
- T. Endothermic Wrap: Flexible, insulating, fire-resistant, endothermic wrap for protecting membrane penetrations of utility boxes, critical electrical circuits, communications lines, and fuel lines.

2.5 MIXING

- A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings immediately to comply with manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping materials.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION OF PENETRATION FIRESTOPPING SYSTEMS

- A. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- C. Install fill materials by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 FIELD QUALITY CONTROL

- A. OWNER will engage a qualified testing agency to perform tests and inspections according to ASTM E2174.

- B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.
- C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.5 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

END OF SECTION 07 84 13S

SECTION 07 84 43S
JOINT FIRESTOPPING

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Joints in or between fire-resistance-rated construction.

1.2 ACTION SUBMITTALS

- A. Product Data:
 - 1. Joints in or between fire-resistance-rated construction.
- B. Product Schedule: For each joint firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing agency.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Listed System Designs: For each joint firestopping system, for tests performed by a qualified testing agency.

1.4 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Approvals according to FM Approvals 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install joint firestopping systems when ambient or substrate temperatures are outside limits permitted by joint firestopping system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure joint firestopping systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

- A. Coordinate construction of joints to ensure that joint firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of joints to accommodate joint firestopping systems.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain joint firestop systems for each type of joint opening indicated from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
 - 1. Perform joint firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Test per testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Joint firestop systems installed with products bearing the classification marking of a qualified product certification agency in accordance with Listed System Designs published by a qualified testing agency.
 - 1) UL in its online directory "Product iQ."
 - 2) Intertek Group in its "Directory of Building Products."

2.3 JOINT FIRESTOPPING SYSTEMS

- A. Joint Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between

which joint firestopping systems are installed. Joint firestopping systems must accommodate building movements without impairing their ability to resist the passage of fire and hot gases.

1. Joint firestopping systems that are compatible with one another, with the substrates forming openings, and with penetrating items, if any.
2. Provide products that, upon curing, do not re-emulsify, dissolve, leach, breakdown, or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture.
3. Provide firestop products that do not contain ethylene glycol.

B. Joints in or between Fire-Resistance-Rated Construction: Provide joint firestopping systems with ratings determined per ASTM E1966 or UL 2079.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. 3M Fire Protection Products.
 - b. Grabber Construction Products, Inc.
 - c. Hilti, Inc.
 - d. Owens Corning.
 - e. ROCKWOOL.
 - f. Specified Technologies, Inc.
 - g. Tremco Incorporated.
2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.

C. Exposed Joint Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E84.

2.4 ACCESSORIES

- A. Provide components of joint firestopping systems, including primers and forming materials, that are needed to install elastomeric fill materials and to maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Before installing joint firestopping systems, clean joints immediately to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
 - 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of elastomeric fill materials or compromise fire-resistive rating.
 - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with elastomeric fill materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by joint firestopping system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Apply a suitable bond-breaker to prevent three-sided adhesion in applications where this condition occurs, such as the intersection of a gypsum wall to floor or roof assembly where the joint is backed by a steel ceiling runner or track.

3.3 INSTALLATION

- A. General: Install joint firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.
- C. Install elastomeric fill materials for joint firestopping systems by proven techniques to produce the following results:
 - 1. Elastomeric fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
 - 2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
 - 3. For elastomeric fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 FIELD QUALITY CONTROL

- A. OWNER will engage a qualified testing agency to perform tests and inspections in accordance with ASTM E2393.
- B. Where deficiencies are found or joint firestopping systems are damaged or removed due to testing, repair or replace joint firestopping systems so they comply with requirements.
- C. Proceed with enclosing joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.5 CLEANING AND PROTECTION

- A. Clean off excess elastomeric fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by joint firestopping system manufacturers and that do not damage materials in which joints occur.
- B. Provide final protection and maintain conditions during and after installation that ensure joint firestopping systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated joint firestopping systems immediately and install new materials to produce joint firestopping systems complying with specified requirements.

END OF SECTION 07 84 43S

SECTION 07 92 00S

JOINT SEALANTS

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Nonstaining silicone joint sealants.
 2. Urethane joint sealants.
 3. Immersible joint sealants.
 4. Butyl joint sealants.
 5. Latex joint sealants.

1.2 ACTION SUBMITTALS

- A. Product Data:
1. Joint sealants.
 2. Joint-sealant backing materials.
- B. Samples for Initial Selection: Manufacturer's standard color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information:
1. Joint-sealant application, joint location, and designation.
 2. Joint-sealant manufacturer and product name.
 3. Joint-sealant formulation.
 4. Joint-sealant color.

1.3 INFORMATIONAL SUBMITTALS

- A. Preconstruction Laboratory Test Schedule: Include the following information for each joint sealant and substrate material to be tested:
 - 1. Joint-sealant location and designation.
 - 2. Manufacturer and product name.
 - 3. Type of substrate material.
 - 4. Proposed test.
 - 5. Number of samples required.
- B. Preconstruction Laboratory Test Reports: For each joint sealant and substrate material to be tested from sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.
- C. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.
- D. Field Quality-Control Reports: For field-adhesion-test reports, for each sealant application tested.
- E. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

- A. Manufacturers' special warranties.
- B. Installer's special warranties.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Authorized representative who is trained and approved by manufacturer.
- B. Testing Agency Qualifications: Qualified in accordance with ASTM C1021 to conduct the testing indicated.

1.6 MOCKUPS

- A. Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Adhesion Testing: Use ASTM C794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Compatibility Testing: Use ASTM C1087 to determine sealant compatibility when in contact with glazing and gasket materials.
 - 3. Stain Testing: Use ASTM C1248 to determine stain potential of sealant when in contact with masonry substrates.
 - 4. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.
 - 5. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 6. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
 - 7. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.
- B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
 - 1. Locate test joints where indicated on Project or, if not indicated, as directed by ENGINEER.
 - 2. Conduct field tests for each kind of sealant and joint substrate.
 - 3. Notify ENGINEER seven days in advance of dates and times when test joints will be erected.
 - 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
 - 5. Test Method: Test joint sealants in accordance with Method A, Tail Procedure, in ASTM C1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

6. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.8 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.9 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Five years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 2. Disintegration of joint substrates from causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain joint sealants from single manufacturer for each sealant type.

2.2 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by ENGINEER from manufacturer's full range.

2.3 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested in accordance with ASTM C1248.
- B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. GE Construction Sealants; Momentive Performance Materials Inc.
 - b. Pecora Corporation.
 - c. Sika Corporation; Joint Sealants.
 - d. The Dow Chemical Company.
 - e. Tremco Incorporated.

2.4 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation.
 - b. Bostik, Inc.
 - c. Pecora Corporation.

- d. Sherwin-Williams Company (The).
 - e. Sika Corporation; Joint Sealants.
 - f. Tremco Incorporated.
- B. Urethane, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade P, Class 25, Uses T and NT.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation.
 - b. Pecora Corporation.
 - c. Sherwin-Williams Company (The).

2.5 IMMERSIBLE JOINT SEALANTS

- A. Immersible Joint Sealants. Suitable for immersion in liquids; ASTM C1247, Class 1; tested in deionized water unless otherwise indicated.
- B. Urethane, Immersible, S, P, 25, T, NT, I: Immersible, single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade P, Class 25, Uses T, NT, and I.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Sika Corporation; Joint Sealants.
 - b. Tremco Incorporated.
 - c. W.R. Meadows, Inc.

2.6 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C1311.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bostik, Inc.
 - b. Pecora Corporation.

2.7 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. May National Associates, Inc.; a subsidiary of Sika Corporation.

- b. Pecora Corporation.
- c. Sherwin-Williams Company (The).
- d. Tremco Incorporated.

2.8 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin) or type as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.9 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile in accordance with Figure 8A in ASTM C1193 unless otherwise indicated.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: OWNER will engage a qualified testing agency to perform tests and inspections.
- B. Tests and Inspections:
 - 1. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
 - a. Extent of Testing: Test completed and cured sealant joints as follows:
 - 1) Perform 10 tests for the first 1000 ft. (300 m) of joint length for each kind of sealant and joint substrate.
 - 2) Perform one test for each 1000 ft. (300 m) of joint length thereafter or one test per each floor per elevation.

- b. Test Method: Test joint sealants in accordance with Method A, Tail Procedure, in ASTM C1521.
 - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 - c. Inspect tested joints and report on the following:
 - 1) Whether sealants filled joint cavities and are free of voids.
 - 2) Whether sealant dimensions and configurations comply with specified requirements.
 - 3) Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
 - d. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
 - e. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
2. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.
- C. Prepare test and inspection reports.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.
 - 1. Joint Locations:
 - a. Isolation and contraction joints in cast-in-place concrete slabs.
 - 2. Joint Sealant: Urethane, S, P, 25, T, NT, I.

- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
 - 1. Joint Locations:
 - a. Control and expansion joints in unit masonry.
 - b. Perimeter joints between materials listed above and frames of doors, windows, and louvers.
 - 2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.

- C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
 - 1. Joint Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 - 2. Joint Sealant: Urethane, S, P, 25, T, NT.

- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
 - 1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Vertical joints on exposed surfaces of masonry partitions.
 - 2. Joint Sealant: Urethane, S, NS, 25, NT.

- E. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.
 - 1. Joint Locations:
 - a. Control joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints between interior wall surfaces and frames of interior doors.
 - 2. Joint Sealant: Acrylic latex.

- F. Joint-Sealant Application: Concealed mastics.
 - 1. Joint Locations:
 - a. Aluminum thresholds.
 - 2. Joint Sealant: Butyl-rubber based.

END OF SECTION 07 92 00S

SECTION 08 11 13S

HOLLOW METAL DOORS AND FRAMES

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Interior steel doors and frames.
 - 2. Exterior steel doors and frames.
 - 3. Glazing for exterior transom.

1.2 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings in accordance with NAAMM-HMMA 803 or ANSI/SDI A250.8.

1.3 COORDINATION

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
- B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.4 SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.
 - 2. Glazing.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door type.

2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 4. Locations of reinforcement and preparations for hardware.
 5. Details of each different wall opening condition.
 6. Details of anchorages, joints, field splices, and connections.
 7. Details of moldings, removable stops, and glazing.
- C. Samples for Initial Selection: For hollow-metal doors and frames with factory-applied color finishes.
- D. Samples for Verification:
1. Finishes: For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches (75 by 127 mm).
- E. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For door inspector.
1. Fire-Rated Door Inspector: Submit documentation of compliance with NFPA 80, Section 5.2.3.1.
 2. Submit copy of DHI Fire and Egress Door Assembly Inspector (FDAI) certificate.
- B. Product Test Reports: For each type of fire-rated hollow-metal door and frame assembly for tests performed by a qualified testing agency indicating compliance with performance requirements.
- C. Field quality control reports.
- D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.7 QUALITY ASSURANCE

- A. Fire-Rated Door Inspector Qualifications: Inspector for field quality control inspections of fire-rated door assemblies is to meet the qualifications set forth in NFPA 80, section 5.2.3.1 and the following:
 - 1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
 - 1. Provide additional protection to prevent damage to factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

1.9 WARRANTY

- A. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated on Drawings, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.

- B. Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

2.2 INTERIOR STANDARD STEEL DOORS AND FRAMES

- A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Extra-Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 3; ANSI/SDI A250.4, Level A.
 - 1. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches (44.5 mm).
 - c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm).
 - d. Edge Construction: Model 1, Full Flush.
 - e. Edge Bevel: Bevel lock and hinge edges 1/8 inch in 2 inches (3.2 mm in 51 mm).
 - f. Core: Manufacturer's standard.
 - g. Fire-Rated Core: Manufacturer's standard vertical steel stiffener core for fire-rated doors.
 - 2. Frames:
 - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm).
 - b. Construction: Face welded.
 - 3. Exposed Finish: Prime.

2.3 EXTERIOR STANDARD STEEL DOORS AND FRAMES

- A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Extra-Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 3; ANSI/SDI A250.4, Level A.
 - 1. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches (44.5 mm).

- c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
 - d. Edge Construction: Model 1, Full Flush.
 - e. Edge Bevel: Bevel lock and hinge edges 1/8 inch in 2 inches (3.2 mm in 51 mm).
 - f. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
 - g. Bottom Edges: Close bottom edges of doors with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
 - h. Core: Manufacturer's standard to meet thermal performance.
- 2. Frames:
 - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
 - b. Transom Frames: Fabricated from same thickness material as adjacent door frame.
 - c. Construction: Face welded.
- 3. Exposed Finish: Factory.
 - 4. Thermal Performance: Refer to Drawing A-02.

2.4 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
 - 2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches (610 mm) of frame height above 7 feet (2.1 m).
 - 3. Postinstalled Expansion Anchor: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.
- B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.
- C. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized in accordance with ASTM A153/A153M, Class B.

2.5 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

- B. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.
- C. Inserts, Bolts, and Fasteners: Hot-dip galvanized in accordance with ASTM A153/A153M.
- D. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- E. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.
- F. Glazing:
 - 1. Heat-Strengthened Float Glass: ASTM C1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 2. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 3. Laminated Glass: ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 - a. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written instructions.
 - b. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
 - c. Interlayer Color: Clear unless otherwise indicated.
 - 4. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified in accordance with ASTM E2190.
 - a. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
 - b. Perimeter Spacer: Manufacturer's standard spacer material and construction.
 - c. Desiccant: Molecular sieve or silica gel, or a blend of both.
 - 5. Clear Insulating, Laminated Glass Type:
 - a. Overall Unit Thickness: 1-3/16 inch (30 mm).
 - b. Minimum Thickness of Outdoor Lite: 6 mm.
 - c. Outdoor Lite: Clear fully tempered float glass.
 - d. Interspace Content: Air.
 - e. Indoor Lite: Clear laminated glass with two plies of heat-strengthened float glass.
 - 1) Minimum Thickness of Each Glass Ply: 4 mm.

- 2) Interlayer Thickness: 0.060 inch (1.52 mm).
- f. Safety glazing required.

2.6 FABRICATION

- A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.
 - 1. Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 3. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- B. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping in accordance with ANSI/SDI A250.6, the Door Hardware Schedule, and templates.
 - 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 - 2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.
- C. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with mitered hairline joints.
 - 1. Provide stops and moldings flush with face of door, and with beveled stops unless otherwise indicated.
 - 2. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.
 - 3. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
 - 4. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

2.7 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.
- B. Factory Finish: Clean, pretreat, and apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, complying with ANSI/SDI A250.3.
 - 1. Color and Gloss: As selected by ENGINEER from manufacturer's full range to match exterior adjacent materials.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

- A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.
- B. Hollow-Metal Frames: Comply with ANSI/SDI A250.11.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.
 - a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
 - b. Install frames with removable stops located on secure side of opening.
 - 2. Fire-Rated Openings: Install frames in accordance with NFPA 80.
 - 3. Floor Anchors: Secure with postinstalled expansion anchors.

- a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
4. Solidly pack mineral-fiber insulation inside frames.
5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.
6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
7. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.
 1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8.
 2. Fire-Rated Doors: Install doors with clearances in accordance with NFPA 80.
- D. Glazing: Comply with hollow-metal manufacturer's written instructions.

3.3 FIELD QUALITY CONTROL

- A. Inspection Agency: OWNER will engage a qualified inspector to perform inspections and to furnish reports to ENGINEER.
- B. Inspections:
 1. Fire-Rated Door Inspections: Inspect each fire-rated door in accordance with NFPA 80, Section 5.2.
- C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.
- E. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80.

3.4 REPAIR

- A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- B. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- C. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish according to manufacturer's written instructions.
- D. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 08 11 13S

SECTION 08 31 23S

FLOOR DOORS

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aluminum floor doors.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details materials, individual components and profiles, and finishes.

PART 2 - PRODUCTS

2.1 ALUMINUM FLOOR DOORS

- A. Angle Frame Aluminum Floor Door:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Activar Construction Products Group, Inc. - JL Industries.
 - b. ACUDOR Products, Inc.
 - c. Babcock-Davis.
 - d. BILCO Company (The).
 - e. Milcor; a division of Hart & Cooley, Inc.
 - f. Nystrom.
 - 2. Frame: Mill finish aluminum, angle profile.
 - 3. Door: Single leaf; 1/4-inch-thick (6.4-mm-thick), diamond-pattern mill-finish aluminum plate.
 - 4. Loading Capacity: 150 lbf/sq. ft. (7.2 kN/sq. m) pedestrian live load.

5. Hardware:
 - a. Material and Finish: Type 316 stainless steel, including latch and lifting mechanism assemblies, hold-open arms, and brackets, hinges, pins, and fasteners.
 - b. Hinges: Heavy-duty butt hinges with stainless steel pins.
 - c. Operating Mechanism: Adjustable counterbalancing springs, heavy-duty hold-open arm that automatically locks door open at 90 degrees, release handle with vinyl grip that allows for one-handed closure, and recessed lift handle.
 - d. Latch: Stainless steel slam latch.

- B. Safety Accessories: Safety railing.

2.2 MATERIALS

- A. Aluminum Extrusions: ASTM B221 (ASTM B221M), Alloy 6063-T6.
- B. Aluminum-Alloy Rolled Tread Plate: ASTM B632/B632M, Alloy 6061-T6.
- C. Aluminum Sheet: ASTM B209 (ASTM B209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
- D. Frame Anchors: Same material as door face.
- E. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.

2.3 FABRICATION

- A. General: Provide floor doors manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure floor doors to types of supports indicated.
- D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.
- E. Aluminum: After fabrication, apply manufacturer's standard protective coating on aluminum that comes in contact with concrete.

2.4 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Comply with manufacturer's written instructions for installing floor doors.

3.3 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION 08 31 23S

SECTION 08 71 00S

DOOR HARDWARE

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Mechanical door hardware for the following:
 - a. Swinging doors.
 - 2. Cylinders for door hardware specified in other Sections.

1.2 COORDINATION

- A. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant. Coordinate door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Field quality-control reports.
- C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of door hardware to include in maintenance manuals.
- B. Schedules: Final door hardware schedule.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and of an Architectural Hardware Consultant who is available during the course of the Work to consult CONTRACTOR, ENGINEER, and OWNER about door hardware and keying.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
- C. Deliver keys to OWNER by registered mail or overnight package service.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including excessive deflection, cracking, or breakage.
 - b. Faulty operation of doors and door hardware.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
 - 2. Warranty Period: Three years from date of Substantial Completion unless otherwise indicated below:
 - a. Manual Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain each type of door hardware from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Door Assemblies: Where fire-rated doors are indicated, provide door hardware complying with NFPA 80 that is listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.

2.3 HINGES

- A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.

2.4 MECHANICAL LOCKS AND LATCHES

- A. Refer to Drawings for specified products. No Substitutions allowed.
- B. Lock Functions: As indicated in door hardware schedule on Drawings.
- C. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
 - 1. Mortise Locks: Minimum 3/4-inch (19-mm) latchbolt throw.
- D. Lock Backset: 2-3/4 inches (70 mm) unless otherwise indicated.
- E. Lock Trim:
 - 1. Description: As indicated on Drawings.
 - 2. Levers: Cast.
 - 3. Dummy Trim: Match lever lock trim and escutcheons.
- F. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
- G. Mortise Locks: BHMA A156.13; Security Grade 1; stamped steel case with steel or brass parts; Series 1000.
- H. Roller Latches: BHMA A156.16; Grade 1; rolling plunger that engages socket or catch, with adjustable roller projection.
- I. Push-Pull Latches: Mortise, BHMA A156.13; with paddle handles that retract latchbolt; capable of being mounted vertically or horizontally.
 - 1. Grade: 1.

2.5 AUXILIARY LOCKS

- A. Bored Auxiliary Locks: BHMA A156.36: Grade 1; with strike that suits frame.



1. Refer to Drawings for specified product. No substitutions allowed.

2.6 EXIT DEVICES AND AUXILIARY ITEMS

- A. Exit Devices and Auxiliary Items: BHMA A156.3, Grade 1.
 1. Refer to Drawings for specified product. No substitutions allowed.

2.7 LOCK CYLINDERS

- A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
- B. High-Security Lock Cylinders: BHMA A156.30; Grade 1 permanent cores that are removable; face finished to match lockset.
 1. Type: M, mechanical.
 2. Refer to Drawings for specified product. No Substitutions allowed.
- C. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

2.8 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, appendix. Provide one extra key blank for each lock.
 1. Master Key System: Change keys and a master key operate cylinders.
 - a. Provide three cylinder change keys and five master keys.
- B. Keys: Nickel silver or Brass.
 1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
 - a. Notation: "DO NOT DUPLICATE."

2.9 ACCESSORIES FOR PAIRS OF DOORS

- A. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release; and with internal override.
- B. Astragals: BHMA A156.22.

2.10 SURFACE CLOSERS

- A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply

with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Refer to Drawings for specified product. No substitutions allowed.

2.11 OVERHEAD STOPS AND HOLDERS

- A. Overhead Stops and Holders: BHMA A156.8.

2.12 DOOR GASKETING

- A. Door Gasketing: BHMA A156.22; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
- B. Maximum Air Leakage: When tested in accordance with ASTM E283 with tested pressure differential of 0.3-inch wg (75 Pa), as follows:
 1. Gasketing on Single Doors: 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) of door opening.
 2. Gasketing on Double Doors: 0.50 cfm per ft. (0.000774 cu. m/s per m) of door opening.

2.13 THRESHOLDS

- A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

2.14 METAL PROTECTIVE TRIM UNITS

- A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch- (1.3-mm-) thick stainless steel; with manufacturer's standard machine or self-tapping screw fasteners.

2.15 FABRICATION

- A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rating labels and as otherwise approved by ENGINEER.
 1. Manufacturer's identification is permitted on rim of lock cylinders only.
- B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

- C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware unless otherwise indicated.
 - 1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
 - 2. Fire-Rated Applications:
 - a. Steel Through Bolts: For the following unless door blocking is provided:
 - 1) Surface hinges to doors.
 - 2) Closers to doors and frames.
 - 3) Surface-mounted exit devices.
 - 3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
 - 4. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.16 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule on Drawings.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Steel Doors and Frames: For surface-applied door hardware, drill and tap doors and frames in accordance with ANSI/SDI A250.6.

3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.
 - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Lock Cylinders: Install construction cores to secure building and areas during construction period.
 - 1. Replace construction cores with permanent cores as directed by OWNER.
- E. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 07 92 00S "Joint Sealants."
- F. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- G. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
 - 1. Do not notch perimeter gasketing to install other surface-applied hardware.
- H. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- I. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 FIELD QUALITY CONTROL

- A. Independent Architectural Hardware Consultant: OWNER may engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
 - 1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DEMONSTRATION

- A. Train OWNER's maintenance personnel to adjust, operate, and maintain door hardware.

END OF SECTION 08 71 00S

SECTION 08 91 00S
EXTERIOR LOUVERS

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Extruded-aluminum combination louver-damper.
 - 2. Blank-off panels for louvers

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
 - 1. Show weep paths, gaskets, flashings, sealants, and other means of preventing water intrusion.
 - 2. Show mullion profiles and locations.
- C. Samples: For each type of metal finish required.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed in accordance with AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.
- B. Sample Warranties: For manufacturer's special warranties.

1.4 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
 - 1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.5 FIELD CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.6 WARRANTY

- A. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of baked enamel, powder coat, or organic finishes within specified warranty period.
 - 1. Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain louvers from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

2.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Louvers withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures are considered to act normal to the face of the building.
 - 1. Wind Loads: Determine loads based on pressures as indicated on Drawings.

- B. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width in accordance with AMCA 500-L.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- D. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

2.3 EXTRUDED-ALUMINUM COMBINATION LOUVER-DAMPERS

- A. Louver Construction and Operation: Provide combination louver-dampers with extruded-aluminum frames and blades of not less than 0.080-inch (2.03-mm) nominal thickness, and with operating mechanisms to suit louver sizes.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Mechanical Drawings or comparable product by one of the following:
 - a. Air Flow Company, Inc.
 - b. Cesco Products; MESTEK, Inc.
 - c. Construction Specialties, Inc.
 - d. Greenheck Fan Corporation.
 - e. Ruskin; Air Distribution Technologies, Inc.; Johnson Controls, Inc.
 - 2. Refer to Drawings for performance and size requirements.
 - 3. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.4 MATERIALS

- A. Aluminum Extrusions: ASTM B221 (ASTM B221M), Alloy 6063-T5, T-52, or T6.
- B. Aluminum Sheet: ASTM B209 (ASTM B209M), Alloy 3003 or 5005, with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Fasteners: Use types and sizes to suit unit installation conditions.
 - 1. For fastening aluminum, use aluminum or 300 series stainless steel fasteners.
- D. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, fabricated from stainless steel components, with allowable load or strength design capacities calculated in accordance with ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing in accordance with ASTM E488/E488M conducted by a qualified testing agency.

- E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

2.5 FABRICATION

- A. Factory assemble louvers to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Vertical Assemblies: Where height of louver units exceeds fabrication and handling limitations, fabricate units to permit field-bolted assembly with close-fitting joints in jambs and mullions, reinforced with splice plates.
 - 1. Continuous Vertical Assemblies: Fabricate units without interrupting blade-spacing pattern.
- C. Maintain equal louver blade spacing to produce uniform appearance.
- D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
- E. Include supports, anchorages, and accessories required for complete assembly.
- F. Join frame members to each other and to fixed louver blades with fillet welds concealed from view unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.6 ALUMINUM FINISHES

- A. Finish louvers after assembly.
- B. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.
 - 1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 2. Color and Gloss: As selected by Engineer from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.3 INSTALLATION

- A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Form closely fitted joints with exposed connections accurately located and secured.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- E. Protect unpainted galvanized- and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.
- F. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 079200 "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

- A. Clean exposed louver surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.

- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Restore louvers damaged during installation and construction, so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.
 - 1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain louvers.

END OF SECTION 08 91 00S

SECTION 09 91 00S

PAINTING

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes interior paint systems and exterior anti-graffiti coating.

1.2 COATING SCHEDULES

- A. Coating Schedule at the end of this Section indicates number of coats and type of paint for each material to be painted. Schedule is a proprietary listing of products. CONTRACTOR may supply comparable products of any listed manufacturer in Part 2 of this Section.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include preparation requirements and application instructions.
 - 2. Indicate VOC content.
- B. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- C. Product Schedule: Use same designations indicated on Drawings and in the Interior Painting Schedule to cross-reference paint systems specified in this Section. Include color designations.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint Products: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures of less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND TYPES

- A. General:
 - 1. Use only one manufacturer's products within a paint system. Do not intermix or thin one product line with another.
 - 2. Provide pure, nonfading color pigments of the type and quality to suit substrates and service indicated.
- B. Materials and Manufacturers:
 - 1. To establish quality and type of paint required, specific paint materials are listed in Paint Schedule in Part 3 of this Section. Paint manufacturer, materials, and colors scheduled in the Finish Selections establish the color required for each surface. Equal paint materials of the other listed acceptable manufacturers may be substituted for materials listed but colors must match colors listed.
 - 2. Acceptable Manufacturers: Manufacturers capable of providing acceptable special coating materials and are capable of matching selected colors and finish include the following:
 - a. Benjamin Moore & Co.

- b. Sherwin-Williams.
- c. ICI Paints, Inc.
- d. PPG Paints
- e. Pratt and Lambert

C. Paint Coordination:

- 1. Provide finish coats compatible with prime coats used. Review other Sections of these Specifications for compatibility of total coatings system.
- 2. Upon request from other trades, furnish information on characteristics of proposed finish materials to ensure compatible prime coats.
- 3. Provide barrier coats over incompatible primers or remove and re-prime as required to provide a proper paint system.
- 4. Notify ENGINEER in writing of any anticipated problems using specified coating systems with surfaces shop-primed by others.

D. Material Compatibility:

- 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- 3. Products shall be of same manufacturer for each coat in a coating system.

E. Colors: Refer to Finish Selections on Drawings.

2.2 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: OWNER reserves the right to invoke the following procedure:

- 1. OWNER will engage the services of a qualified testing agency to sample paint materials. CONTRACTOR will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
- 2. Testing agency will perform tests for compliance with product requirements.
- 3. OWNER may direct CONTRACTOR to stop applying paints if test results show materials being used do not comply with product requirements. CONTRACTOR shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. CONTRACTOR will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Masonry (Clay and CMUs): 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- E. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.

- F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 INSTALLATION

- A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 FIELD QUALITY CONTROL

- A. Dry-Film Thickness Testing: OWNER may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry-film thickness.
 - 1. CONTRACTOR shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry-film thickness of applied paint does not comply with paint manufacturer's written recommendations, CONTRACTOR shall pay for testing and apply additional coats as needed to provide dry-film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 - 1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
 - 2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
 - 3. Allow empty paint cans to dry before disposal.
 - 4. Collect waste paint by type and deliver to recycling or collection facility.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by ENGINEER, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR COATING SCHEDULE

- A. Anti-Graffiti Coating for unpainted CMU and Concrete:
 - 1. Surface Prep: Prosoco cleaner
 - 2. Two full coats Prosoco Sure Klean Weather Seal Blok-Guard and Graffiti Control II clear coating or equal as approved by authorities having jurisdiction.

3.7 INTERIOR PAINTING SCHEDULE

- A. Exposed Construction at Ceilings:
 - 1. Surface Preparation: All surfaces must be smooth and clean. Prep surfaces in accordance with coating manufacturer's written instructions.
 - 2. Finish: 2 coats S-W ProIndustrial Acrylic Dryfall
- B. Ferrous Metals - Hollow Metal Doors and Frames:
 - 1. Primer: 1 coat S-W Pro Industrial Pro-Cryl Primer
 - 2. Finish: 2 coats S-W Pre-Catalyzed Epoxy Semi-Gloss
- C. Concrete Masonry Units at interior face of exterior walls:
 - 1. Primer: 1 coat S-W PrepRite Block Filler.
 - 2. Finish: 2-3 coats S-W ProMar 200 Zero VOC Latex Semi-Gloss Enamel.

- D. Concrete Masonry Units at interior partitions:
1. Primer: 1 coat S-W Loxon Block Surfacer.
 2. Finish: 2 coats S-W Pre-Catalyzed Epoxy Eg-Shel.

END OF SECTION 09 91 00S

SECTION 10 44 16S
FIRE EXTINGUISHERS

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

1.2 SUBMITTALS

- A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.
- B. Warranty: Sample of special warranty.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.4 COORDINATION

- A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period.
 - b. Faulty operation of valves or release levers.

2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
 1. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each mounting bracket indicated.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Babcock-Davis.
 - b. Badger Fire Protection; a Carrier company.
 - c. Buckeye Fire Equipment Company.
 - d. Fire-End & Croker Corporation.
 - e. Guardian Fire Equipment, Inc.
 - f. J. L. Industries, Inc.; Activar Construction Products Group, Inc.
 - g. Kidde; Carrier Global Corporation.
 - h. Larsen's Manufacturing Company.
 - i. Nystrom, Inc.
 - j. Potter Roemer LLC; a Division of Morris Group International.
 2. Source Limitations: Obtain fire extinguishers, fire-protection cabinets, and accessories, from single source from single manufacturer.
 3. Valves: Nickel-plated, polished-brass body.
 4. Handles and Levers: Stainless steel.
 5. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B.
- B. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 4-A:60-B:C, 10-lb (4.5-kg) nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

2.3 MOUNTING BRACKETS

- A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or black baked-enamel finish.
 - 1. Source Limitations: Obtain mounting brackets and fire extinguishers from single source from single manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fire extinguishers for proper charging and tagging.
 - 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
- B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.
 - 1. Mounting Height: Top of fire extinguisher to be at 42 inches (1067 mm) above finished floor, unless otherwise shown.

END OF SECTION 10 44 16S

SECTION 11 24 29S

FACILITY FALL PROTECTION

Add this Supplemental Specification to the Contract Documents.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Rooftop Fall Protection System equipment including:
 - a. System design
 - b. Tieback anchors
 - c. Davits

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review sequence of operation for each type of equipment.
 - 2. Review required testing, inspecting, and certifying procedures.

1.3 ACTION SUBMITTALS

- A. Product Data: Manufacturers' data and product information for manufactured materials and products:
 - 1. Test report certified by a professional engineer
 - 2. General product data
 - 3. Detailed drawings of equipment proposed
 - 4. Installation instructions
- B. Shop Drawings: For fabrication and erection.
 - 1. Submit scaled shop drawings showing location plan of all support equipment and sections detailing all parts and accessories.
 - 2. Clearly specify equipment dimensions, materials, fabrication details, hardware, and installation instructions.
 - 3. Include notes with guidelines of proper use of system.
 - 4. Equipment location plan to include identification number next to each piece of equipment that are permanently affixed to a structure.

5. Shop drawings shall be prepared under supervision of a registered professional engineer and shall bear engineer's seal and signature. Professional engineer shall be licensed in jurisdiction where project is located. Include P.E. certified report of tested equipment.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Provide documentation verifying company's amount of experience and successful performance in design, fabrication, and installation of permanent window washing fall protection equipment.
 1. Submit listing of company's installations representing similar scope and complexity to project requirements for previous 10 years. List shall include information as follows:
 - a. Project name and address.
 - b. Name of Owner.
 - c. Name of Contractor.
 - d. Name of Engineer.
 - e. Date of completion.
 2. Provide documentation verifying that installers have been trained by the manufacturer and are competent.
- B. Delegated Design Submittal: Design of the fall protection system shall be performed by an Engineer with experience in designing not less than 5 installations of similar size and scope.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fall protection systems to include in operation and maintenance manuals.
 1. Submit operations & maintenance guidance in accordance with the requirements of Division 01.

1.6 QUALITY ASSURANCE

- A. Manufacturer/Installer Qualifications: Provide products from a company specializing in design, fabrication, and installation of permanent suspended access equipment with a minimum of 5 years documented experience. Companies like miscellaneous metal fabricators not normally engaged in design and fabrications of suspended access equipment are not acceptable.
 1. Manufacturer and installer shall have specific liability insurance (products and completed operations) in an amount not less than \$5,000,000.
 2. Installer(s) shall be trained or qualified by manufacturer in installation techniques and procedures of permanent suspended access equipment.

- B. In order to assure uniform quality, ease of maintenance and minimal parts storage, it is the intent of these Specifications that all equipment called for under this Section shall be supplied by a single source. The equipment supplier shall, in addition to the installer, assume the responsibility for proper and complete installation.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened protective packaging.
- B. Store materials in original protective packaging. Prevent soiling, physical damage or wetting.

1.8 FIELD CONDITIONS

- A. Field Measurements: Perform prior to preparation of Shop Drawings and fabrication drawings to ensure required fit and dimensions.

PART 2 - PRODUCTS

2.1 EXTERIOR ROOF-TOP SYSTEM DESCRIPTION

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Fall Protection System by Summit Anchor Company, www.summitanchor.com
 - 1. Substitutions: Engineer will consider products of comparable manufacturers as a substitution, pending the contractor's submission of adequate documentation of the substitution in accordance with procedures in Division 1 of the Project Manual.
- B. Anchorage Design Requirements:
 - 1. Safety anchor system design shall comply with current OSHA, ANSI, and local regulations pertaining to window cleaning and fall protection.
 - 2. Anchor system shall provide independent fall arrest anchorages as required by OSHA and ANSI requirements, and as shown on Drawings.
- C. Davit Design Requirements:
 - 1. Davits shall be capable of supporting an ultimate load of not less than 4 times the rated load. The rated load of the davit shall be based on the swing stage hoist and powered platform load capacity, which is frequently 1,000 lbs or more.
 - 2. Manufacture shall provide engineer's calculations and test report to verify that davit will support load requirements.

2.2 STRUCTURAL COMPONENT MATERIALS

- A. Exposed Structural Components Finish: Galvanized Mild Steel or Stainless Steel:
 - 1. Steel: ASTM A572 GR 50
 - 2. Steel: ASTM A A36
 - 3. Galvanizing: ASTM A123
 - 4. Stainless Steel; 304 ASTM A 193 Grade B8, Class 2
 - 5. Aluminum; 6061-T6 Alloy
- B. Yield Strength:
 - 1. Base Plates and Bottom Plates, High Strength Steel: 50 ksi minimum
 - 2. Other Sections: 36 ksi minimum
- C. Non-Structural Components:
 - 1. Aluminum; 6061-T6 Alloy
 - 2. Alloys shall conform to requirements published in AA Aluminum Standards.
 - 3. Sheet and Plate: ASTM B209
 - 4. Extruded Bars, Rods, Shapes, and Tubes: ASTM B221
- D. Hollow Structural Sections (HSS):
 - 1. ASTM A500, Grade C
 - 2. Yield Strength: 46 ksi minimum (round shapes) and 50 ksi (square and rectangular shapes)
 - 3. Tensile Strength: 62 ksi minimum
- E. Round Pipe Sections:
 - 1. ASTM A53, Grade B
 - 2. Yield Strength: 35 ksi minimum
 - 3. Tensile Strength: 60 ksi minimum
- F. Nuts, Bolts, Davit Pins, and Washers:
 - 1. Stainless Steel; 304 ASTM A 193 Grade B8 or F593C
 - 2. Galvanized Flat Washers ASTM F-436 or 18 -8 Stainless Steel
- G. Anchor Bolts, for securing base plate:
 - 1. Metal: Stainless Steel, 304 Stainless Steel; ASTM A 193 Grade 8, B8
 - 2. Size: 5/8 in. diameter minimum

2.3 MANUFACTURED UNITS

- A. Anchor:
 - 1. Capable of withstanding 5000 lbs. (2268kg) in any direction without permanent deflection.
 - 2. Anchor eye size: Not less than ¾ inch (20 mm) diameter material with 2 ¼ in (60 mm) eye opening.

3. Anchor eye metals:
 - a. Forged, 1030 quenched and tempered per ASTM 576-90-b, 72 ksi minimum.
 - b. Forged Stainless steel, type 304, solution annealed, 35 ksi minimum.
 4. Anchor tube height: not less than 4 in. above the finished roof.
- B. Davit Base:
1. Stanchion type complete with davit adapter and lock pin with stainless steel safety snap pin.
 2. Davit socket; with two stainless steel hinge pins and self-locking ring-snap pins.
 3. Pier Height: generally not less than 8 in. above finished roof surface to allow proper fit up with adaptor.
- C. Flashing:
1. EPDM gasket seal top and base.
 2. Seamless Spun Aluminum Flashing: ASTM B221; Type 6061-T6 alloy.
 3. Stainless Steel: 304.
- D. Cast-in-Place Equipment:
1. A minimum of two cast-in-place steel studs are required for concrete embedded anchors.

2.4 FABRICATION

- A. Fabricate work true to dimension, square, plumb, level, and free from distortion or defects detrimental to appearance and performance.
- B. Grind off surplus welding material to ensure exposed surfaces are smooth so as not to abrade workers' ropes.
- C. Welding shall be in accordance with the AWS Structural Welding Code D1.1/D1.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Report to general contractor any conditions that deviate from shop drawings or any defects in workmanship that would cause an unsafe installation. This report shall be verified in writing to the general contractor and any other responsible party.

- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install in accordance with approved shop drawings and manufacturer's instructions.
- B. Install anchorages and fasteners in accordance with manufacturer's recommendations and instructions to obtain the allowable working loads published in the product literature and instructions and in accordance with this specification. Do not load or stress fall protection system until all materials and fasteners are properly installed and ready for service.

3.3 FIELD QUALITY CONTROL

- A. Inspection and Site Visits:
 - 1. Inspections and site visits shall be performed while installation of equipment is in progress under the supervision of qualified professional engineer registered in the jurisdiction where the project is located.
 - 2. On site inspection of equipment welded to structure shall be performed by an AWS Certified Welding Inspector verifying, in writing, size and quality of welds. Such an inspection shall be performed on each piece of equipment before roofing material is installed.
 - 3. On site inspection shall be performed on all cast in place items while being tied in with the rebar with sufficient time before concrete is poured to allow to adjustments to embedded items as recommended by inspector.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain equipment.

END OF SECTION 11 24 29S

SECTION 15 48 30S
NATURAL GAS PIPING SYSTEM

Add this Supplemental Specification to the Contract Documents.

PART 1: GENERAL

1.1 SUMMARY

- A. The scope of Work to be performed under this Section consists of providing all material, labor, incidental items and time needed to construction natural gas piping and appurtenances as shown on the Drawings and herein specified.

1.2 RELATED SECTIONS

- A. Trenching, Backfilling, and Compacting

1.3 QUALITY ASSURANCE

1.4 REFERENCE STANDARDS

- A. Equipment shall comply with the practices, methods and standards of the specifications as listed below.
 - 1. AGA – Purging Principles and Practices
 - 2. ANSI – Z.223.1
 - 3. FM – Factory Mutual
 - 4. NFPA 54 – National Fuel Gas Code
 - 5. NFPA 70 – National Electric Code
 - 6. NFPA 37 – Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
- B. All equipment and accessories furnished shall be Listed and Labeled as defined in National Electric Code, Article 100.

1.5 SUBMITTALS

- A. Wiring Diagrams
 - 1. Submit wiring diagrams detailing wiring for signal, alarm and control systems for each item of equipment with electric power supply.
- B. Operation and Maintenance Data
 - 1. Submit operation and maintenance data for natural gas specialties and special duty valves, including assembly drawings, trouble shooting maintenance procedures and parts source telephone number.



Provo City

BARR

Natural Gas Piping System

Rock Canyon Aquifer Storage Booster Station & Transmission Line 15 48 30S-1

PROVOEN202320182, Bid No. 1

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site, protect and store until set in place.
- B. Coordinate with OWNER'S Designated Representative for careful handling and placement of the equipment and accessories.

1.7 BASIS FOR COMPENSATION

- A. Compensation for all Work included under this Section shall be as set forth in Section 01 22 00S, Measurement and Payment.

PART 2: PRODUCTS

2.1 GENERAL

- A. All devices and operating components shall be UL listed or FM or CSA approved for applicable gas service.

2.2 PIPING MATERIALS

- A. Steel pipe and fittings for underground installations shall be furnished with external surfaces factory coated with epoxy resin.

2.3 GAS PRESSURE REGULATORS

- A. Qualities
 - 1. Cast iron body, self-contained, spring loaded, lock-up type with nitrile diaphragm. Regulators shall be CSA approved.
 - 2. Internal relief valve sized for total downstream overpressure protection. If total downstream overpressure pressure protection is unavailable, a separate relief valve shall be installed.
- B. Source
 - 1. Fisher Regulator Co.
 - 2. Sensus, Inc.
 - 3. OWNER-approved equal

2.4 SAFETY AUTOMATIC RESET VALVE - ELECTRICALLY ENERGIZED TYPE

- A. Qualities
 - 1. Full opening electrically operated automatic reset gas shut-off valve. Valve shall be UL listed and FM approved.
 - 2. Open and close position indicator.

3. Auxiliary double pole double throw VOS-2 and VCS-2 “valve open/close switches.”
4. 115 volt latching device.
5. Electric valve motor characteristics; 110 Volt, 60 Hertz, 1 phase.
6. Threaded upstream and downstream plugged ports.
7. Weatherproof enclosure.
8. Artic lubrication is required when valve is installed in areas having ambient temperatures below -20 degrees Fahrenheit.

B. Source

1. Maxon Series 5000 (sizes ¾” through 4”)
2. Maxon Series 7000 (sizes 4” through 6”)
3. OWNER-approved equal

2.5 GAS PRESSURE

A. SWITCH: 0.5” W.C. to 150” W.C.

1. Qualities

- a. Industrial grade gas pressure activated diaphragm combustion switch. Switch shall have UL or FM or CSA approval.
- b. Single pole double throw (SPDT) switch with manual reset.
- c. Minimum electrical rating shall be 5.0 amps at 125 Vac.
- d. Type 4 weatherproof enclosure is required for all installations.
- e. Buna N diaphragm suitable for a temperature range of -20 to 250 Deg F.
- f. Switch to have secondary chamber with vent.
- g. Switch to have a cover with retaining chain.
- h. Switch to be manual reset type.

2. Source

- a. Ashcroft B4 29 XCH (range) → Manual reset on decreasing pressure.
- b. Ashcroft B4 28 XCH (range) → Manual reset on increasing pressure.
- c. OWNER-approved equal.

2.6 RELIEF VALVE – SPRING LOADED

A. Qualities

1. Relief valve shall be sized to relieve the maximum regulator flow capacity with minimum build-up of downstream pressure.

2. Valve shall be spring loaded throttling type, with screwed cast iron body, and nitrile or neoprene seats.
- B. Source
1. Fisher Controls Company
 2. OWNER-approved equal

PART 3: EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Outdoor underground gas piping shall have a minimum cover of 36 inches.
- B. All piping shall be marked in accordance with the Mechanical Identification Section of this Specification.

3.2 GAS PIPING INSTALLATION

- A. Do not install any gas piping in or through circulating air ducts, chimneys or gas flues, ventilating ducts or elevator shafts.
- B. Install gas piping at a uniform grade of 0.1 percent slope upward toward risers. Connect branch piping to main at the top or side. Use eccentric reducer fittings at changes in pipe size with the level side down on horizontal pipes. Bushings are not permitted. Install gas piping at equipment to allow maximum service access and removal of sub-assemblies for repair.
- C. Install unions in piping 2 inch and smaller, adjacent to each control valve, gas pressure regulator, safety valve, solenoid valve, and at final connections to each piece of equipment.
- D. Install drips at points where condensate can collect. This includes outlets of gas meters and at the bottom of vertical runs of pipe. Locate drips where readily accessible to permit cleaning. Do not install where condensate would be subject to freezing.
- E. Install strainers on the supply side of each control valve, gas pressure regulator, safety valve, and solenoid valve.
- F. Hot taps are not permitted on gas piping.
- G. Purging and repurging shall be done in accordance with the Piping Materials and Methods Section of this Specification. Purge medium shall be dry nitrogen. Physically disconnect section of pipe to be modified if purge connections are not available. Discharge purge and repurge exhaust in a safe exterior location. Avoid fan intakes and areas where an ignition source may exist.

3.3 HDPE PIPE

- A. See the Piping Materials and Methods Section of this Specification.

3.4 GAS VENT PIPING

- A. Furnish and install natural gas vent piping as shown on the Drawings or as directed by ENGINEER.
- B. Vent piping shall be run to outdoor atmosphere from each of the following devices.
 - 1. Normally open, electrically operated vent valve installed in the vent line connected between the two automatic safety shut-off valves on the fuel line of main gas burners.
 - 2. Normally open, electrically operated vent valve installed in the vent line connected between the two automatic safety shut-off valves on the burner igniter (pilot line).
 - 3. Diaphragm operated gas pressure regulators and flow control valves.
 - 4. Gas pressure switches.
- C. An independent gas vent pipe shall be installed for each of the devices mentioned above.
- D. Vent piping for fuel lines (subparagraphs B.1 and B.2 above) shall conform to the following requirements.
 - 1. Vent Line Diameter

Fuel Line Diameter Inches	Vent Line Diameter Inches
Up to 1/2	1/2
3/4 to 1-1/2	3/4
2	1
2-1/2	1-1/4
3	1-1/4
4	2
5	2
6	2-1/2
8	4

- 2. For fuel line diameters larger than 8 inches, the vent line shall have a cross-sectional area at least 15 percent that of the fuel line.
- E. Vent lines exceeding 50 feet in length shall be enlarged to the next larger size than that shown in the above table.
- F. Vent piping for removal of leakage gas from pressure regulator valves (subparagraphs B.3 and B.4 above) shall have a diameter no smaller than the gas bleed tapping on the respective diaphragm valve actuator or switch housing.
- G. Vent piping shall be piped through the roof or sidewall and terminated at an approved safe location in the outdoor atmosphere with its outlet pointed down. Roof terminals shall rise a minimum of 42 inches above the roof. Outlet nipples shall be 4 inches long and the opening shall be fitted with a 40-mesh brass or stainless steel screen brazed in

place or installed in a half union. Refer to the Drawings for further details of vent terminals.

3.5 INSTALLATION OF SAFETY GAS SHUT-OFF VALVE

- A. Requirements
 - 1. Valves to be mounted in horizontal pipe with the stem up.
 - 2. Furnish and install separate high and low gas pressure switches to trip the safety shut-off valve on rise and fall of gas supply pressure to set pressures indicated on the Drawings.
 - 3. High-pressure tap shall be installed downstream and low-pressure tap installed upstream from the safety shut-off valve.
 - 4. Install switches on a common panel where shown on the Drawings.
 - 5. Palm operated switches for tripping the valve will be provided by Others.

3.6 GROUNDING

- A. Install above ground portions of natural gas piping systems that are upstream from equipment shut-off valves, in an electrically continuous manner. The gas piping system shall be bonded to a grounding electrode according to NFPA 70.
- B. Do **NOT** use gas piping as a grounding electrode.

3.7 NATURAL GAS ENGINES

- A. Natural gas engines are furnished and installed by Others.
- B. Connect engines to gas mains.
 - 1. Emergency or safety generators shall be connected to a firm gas source on the gas service entrance piping upstream of the building safety shutoff valve.
- C. Install a safety valve downstream of the generator gas pressure regulator.

3.8 EQUIPMENT SCHEDULES

- A. Refer to equipment schedules on the Drawings for capacities and other requirements.

END OF SECTION 15 48 30S

SECTION 21 11 00S
BUILDING SERVICES PIPING

Delete Standard Specification 21 11 00 in its entirety and replace it with the following:

PART 1: GENERAL

1.1 SUMMARY

- A. The conditions of the Construction Contract and Division 1—General Requirements apply to the Work specified in this section.
- B. Work required under this section includes furnishing and installation of all pipe, fittings, supports, hangers, valves, sleeves, and appurtenances as specified herein and shown on the drawings, including but not limited to the following building services piping systems:
 - 1. Sanitary waste, drain, and vent (SS, V)
 - 2. Natural gas (NG)

1.2 QUALITY ASSURANCE

- A. CONTRACTOR shall use only thoroughly trained and experienced personnel who are completely familiar with the requirements of this Work and with the installation recommendations of the manufacturers of the specified items.

PART 2: PRODUCTS

2.1 SANITARY DRAIN, WASTE, AND VENT (SS, V)

- A. Pipe and Fittings Hubless cast iron pipe and fittings and no-hub couplings.

or

Polyvinyl Chloride (PVC) plastic pipe and fittings,
Schedule 40 unthreaded, ASTM D2665, socket type
fittings.
- B. Pumped Discharge Polyvinyl Chloride (PVC) plastic pipe and fittings,
Schedule 40 unthreaded, ASTM D1785 pressure-rated,
socket-type fittings.

NOTE: Schedule 40 plastic pipe shall not be threaded.
Where threaded connections are necessary for connecting

pipng to equipment use Schedule 80 plastic pipe and fittings.

- C. Manhole
Standard 48-inch manhole, precast 8-inch thick base slab, precast 5-inch thick bottom riser, intermediate risers and cone sections, reinforced adjusting rings, and steps cast-in-place, as manufactured by Cretex or equal.
Use Neenah R-1916-D watertight manhole frame and bolted lid.
- D. Sump Pump
Barnes Series SP33A, 1/3 HP, 3450 rpm, 60 Hz or equivalent. Approximately 20 feet of head at 25 gpm or approved equal
- E. Floor Drain
Sioux Chief 842-2PNR 2" x 3" PVC on-grade schedule 40 adjustable floor drain or equivalent

2.2 NATURAL GAS (NG)

A. Pipe

- 2 NPS and Smaller
Black carbon steel, standard weight, seamless or welded, ASTM-A53 or A120, threaded and coupled.
- 2-1/2 NPS and Larger
Black carbon steel, standard-weight, seamless or welded, ASTM A53 or A120, Grade B, bevel ends.

Piping run outside exposed above ground must be coated with an approved rust-resistant material.

B. Pipe—Below Ground

- 2 NPS and Smaller
Underground plastic piping, ASTM D2513 with electrically continuous corrosion-resistant tracer wire (minimum AWG 14)

or

Seamless copper tube, Type L, ASTM B88, soft temper.

2-1/2 NPS and Larger Black carbon steel, standard-weight, seamless or welded, ASTM A53 or A120, Grade B, bevel ends.

Pipe run below ground must have cathodic protection.

C. Fittings

2 NPS and Smaller 150-pound malleable iron, screwed, ASTM-A47 and A153.

2-1/2 NPS and Larger Standard-weight, welding fittings, black, ASTM A234-WPB.

Pipe joint compounds must be insoluble in natural and LP gas.

D. Valves

2 NPS and Smaller Lubricated plug or ball type.

2-1/2 NPS and Larger Ball type.

Valves and appurtenances must be designed and approved for use with fuel gas.

2.3 HANGERS AND SUPPORTS

A. Hangers for horizontal individual pipe run designed to permit vertical adjustment and lateral movement; adjustable wrought clevis, Grinnell Figure 260, or equal.

B. Protection shields to protect pipe insulation; Grinnell Figure 167, or equal.

PART 3: EXECUTION

3.1 INSPECTION

A. CONTRACTOR shall be responsible for materials required to provide the products as specified and no damaged products will be allowed for installation.

3.2 INSTALLATION

A. Install piping in locations and sizes as shown on the Design Drawings.

B. Pipe sizes shown on the drawings are nominal pipe sizes, not outside diameters.

C. Reserve the right to authorize minor route changes to avoid conflict with other trades or existing obstructions at no additional cost to the OWNER.

- D. The piping layout includes provision for expansion in the form of offsets or loops. Install piping to take advantage of every available means to facilitate thermal expansion of pipe. Use expansion joints only where specified or where other methods are not feasible. Provide anchors and guides to control direction of travel.
- E. Standard-weight IPS brass nipples and adapters are required between copper tubing and fixtures. Steel or iron nipples are not permitted between copper lines and brass valves or trim.

3.3 FABRICATION

A. Arrangement

1. Arrangement of piping when installed shall follow the drawings, shall be neat in appearance, convenient to operate, properly supported, and shall provide for proper expansion and drainage.
2. Reserve the right to authorize minor route changes to avoid conflict with other trades or existing obstructions at no additional cost to the OWNER.
3. Install unions within 2 feet of each threaded end valve or equipment for removal of any valve or piece of equipment necessary for future repair or replacement.

B. Valve Location

1. Locate valves and accessories where indicated on the drawings and for ease in operation and maintenance. Install valves with operating stems in the upright vertical through horizontal position only and at an easy operating height wherever possible. Check valves for smooth operation.

C. Threads

1. Screwed joints shall have clean machine-cut threads and shall be made up with a suitable pipe compound. Also use thread lubricant on all bolts and studs.

D. General Fabrication Instructions

1. Give particular attention to piping connected to equipment and valves with the aim to insure that no stress is placed on the equipment because of insufficient pipe support.
2. Cutting or weakening of building structural members to facilitate piping installation will not be permitted.
3. Install materials per manufacturer's recommendations.

E. Pipe Supports

1. CONTRACTOR shall furnish and install complete pipe supports, guides, and anchors as required.
2. Locate hangers at or near changes in direction and at concentrated loads.

3. Support pipe in such a manner so as to insure that no stress is placed on the equipment.
4. Maximum pipe support spacing, if not indicated on the drawings, shall not exceed the following spacing for horizontal piping.

Spacing					
Pipe Size	Copper Pipe	Steel Pipe	PVC Pipe	Cast Iron Pipe	Rod Diameter
Up to 1-1/4"	6'	7'	32"	5'	3/8
1-1/2"	8'	9'	32"	5'	3/8
2"	8'	10'	32"	5'	3/8
2-1/2"	9'	11'	32"	5'	1/2
3"	NA	12'	32"	5'	1/2
4" and 5"	NA	12'	32"	5'	5/8
6"	NA	12'	32"	5'	3/4
8"	NA	NA	32"	5'	3/4

5. Hanging from 1 pipe to another is prohibited.
6. Support vertical piping at every floor.
7. CONTRACTOR shall furnish and install steel and any concrete work necessary for supporting the piping and for the attachment of supports, guides, sway bracing, or anchors. Design and install this Work with regard to appearance and convenience, as well as adequate strength and rigidity.
8. Set supports to grades and lines so that the finished installation will provide uniform slope for drainage, where applicable.
9. Weld pipe supports and cradle assemblies to the piping prior to installation of insulation, where applicable.

F. Penetrations

1. CONTRACTOR will be responsible for penetrations through floors and walls for pipes and shall furnish and install properly grouted or welded in steel pipe sleeves. Wall sleeves shall be minimum 2-inches larger than the pipe diameter, including insulation and shall be standard weight.
2. CONTRACTOR shall patch holes made by this CONTRACTOR in the walls and floors. Patch holes in a neat workmanlike manner. Where necessary to cut a hole through concrete or masonry, use a core drill for holes 8 inches and smaller in diameter.
3. CONTRACTOR will be responsible for caulking annular space between pipe and/or pipe insulation and pipe sleeve in penetrations through exterior walls. CONTRACTOR shall patch and calk exterior penetrations in such a manner as to

make them watertight and leak-proof. Match flashing for metal siding penetrations siding and make weathertight.

4. For underfloor wall penetrations through containment access sump, provide modular, mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and the wall sleeve opening. Elastomeric element shall be EPDM for standard service application. Size wall sleeve according to manufacturer's recommendations or as shown on the Design Drawings. Seal shall be Link-Seal or equal.
5. Floor sleeves shall project approximately 1/2 inch above the finished floor and be even with the underside of the floor. Floor sleeves shall be cast-in-place or permanently sealed into the floor structure to prevent any water on the floor above from following the pipe system.
6. Drill penetrations for piping at finished walls or ceilings in a neat and workmanlike manner. Finish piping penetrations with a chrome-plated steel plate for a neat appearance.

G. Protection and Cleaning

1. Treat steel pipe for complete removal of oil and mill scale. CONTRACTOR shall be responsible for checking the complete removal of such scale and oil before fabrication and installation.
2. Particular care must be exercised by the CONTRACTOR to prevent loose welding metal, welding rods, dirt, and miscellaneous scrap from getting into the piping systems.
3. After installation and before final connection to complete the piping systems, hammer each piping section to remove any remaining scale and blow clean with compressed air.
4. Blow or flush out lines until they are clear of foreign material. Temporary connections shall be by the CONTRACTOR.
5. Clean out equipment and accessories after lines have been blown or flushed out.

3.4 IDENTIFICATION

- A. Label new pipes in accordance with ANSI A-131 standard, or as directed by OWNER's Representative.
- B. Mark pipes at 50-foot maximum intervals on long straight runs, near 90-degree elbows, near either side of wall penetrations, and on each branch.
- C. Apply markers to the insulation jacket.

3.5 TESTING AND ACCEPTANCE

- A. After completion of Work, the CONTRACTOR shall thoroughly test, to the satisfaction of the OWNER's Representative, all the Work installed hereunder. Test closed piping systems before the system is placed in operation.
- B. Maintain the required test pressure a sufficient length of time to enable an inspection to be made of joints and connections. Perform piping tests as follows:

Type of Piping	Test Pressures	Test Medium	Test Period
NG, LP	10 psi	Air	15 min
Sanitary Waste and Vent	5 psig	Air	15 min.
Hot and Cold Water	150 psig	Hydrostatic	2 hours
Hot Water Supply and Return	100 psig	Hydrostatic	1 hour

- C. Conduct the air tests and hydrostatic tests as follows:
 - 1. Air Test: make the air test by attaching an air compressor testing apparatus to any suitable opening and after closing other inlets and outlets to the system, forcing air into the system until there is a uniform gage pressure as specified above. Hold this pressure without introduction of additional air for a period of time as listed above.
 - 2. Hydrostatic Test: fill the system being tested with water and bring up to a pressure as specified above. Hold the system at that pressure for a specified time and make a visual inspection of the system. There shall be no signs of leakage.
- D. Test pressure piping in accordance with ASME B31
- E. Provide temporary equipment for testing, including pump and gages. Test piping system before insulation is installed wherever feasible and remove control devices before testing. Test each natural section of each piping system independently but do not use piping system valve to isolate sections where test pressure exceeds valve pressure rating. Fill each section with water and pressurize for indicated pressure and time.
 - 1. Required test periods is 2 hours.
 - 2. Test long runs of Schedule 40 pipe at 150 psi, except where fittings are lower class or pressure rating.
 - 3. Test each piping system at 150 percent of operating pressure indicated, but not less than 25-psi or greater than 350 psi.

4. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 1 psi.
- F. Repair piping system sections that fail required piping test by disassembly and reinstallation, using new materials to extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.
- G. Drain test water from piping systems after testing and repair work has been completed.
- H. Leaks in fuel gas piping must be located by applying soapy water to the exterior of each threaded piping joint. It is not permissible to repair defects found in fuel gas piping systems or fittings. The defective pipe or fitting must be removed and replaced with new materials.
- I. CONTRACTOR shall furnish equipment, temporary-testing materials, and labor necessary to perform the test called for in this specification. Piping blanked off or piping components removed in order to perform the test shall be reinstalled at no extra cost.
- J. Any portion of the Work failing the tests described herein shall be repaired promptly and retested by the CONTRACTOR at no additional cost to the OWNER.
- K. While holding the test pressure, visually inspect joints for leaks. Maintain test pressure until released by the OWNER's Representative.
- L. When Work has been completed to the satisfaction of the OWNER and tests have been successfully met, the Work will be accepted by the OWNER subject to the guarantees, which are in force after acceptance.
- M. Make test records for each piping installation tested. Make the records on recording charts with a recording gage. Turn records over to the OWNER. These records shall include date, system being tested, test fluid, test pressure, and OWNER's Representative's approval.
- N. Potable Water System Only
 1. After pressure testing is completed, disinfect the completed potable water system, and interconnected systems. Treat the system, including the water service connection, with chlorine to a concentration not less than 50 PPM for 8 hours. Flush with clean water until residual chlorine content of .2 PPM, or less, is reached. Open and close affected valves in the system several times during the disinfecting period. Repeat disinfection if necessary to pass state and local bacteriological tests.

3.6 EXPANSION JOINTS

- A. This CONTRACTOR shall furnish and install expansion compensation as shown on the drawings and in accordance with instructions furnished by the manufacturer.
- B. Furnish guides by the expansion compensator manufacturer and guide spacing will be as shown on the drawings.

3.7 ADJUSTING AND BALANCING

- A. Operate, adjust, and calibrate controls.
- B. Operating Tests
 - 1. Give advanced notice of tests to permit observation. Operate nearly as possible to design conditions for 48 hours, not necessarily continuously. Log sufficient data for approval and to prove satisfactory operation.
 - 2. Make necessary repairs or replacements as required prior to final acceptance.
- C. ENGINEER shall receive a copy of testing results prior to final acceptance.

END OF SECTION 21 11 00S

SECTION 22 11 14S FACILITY VALVES AND ACTUATORS

Add this Supplemental Specification to the Contract Documents.

PART 1: GENERAL

1.1 SUMMARY

- A. Section includes process valves and actuators associated with process piping.

1.2 RELATED SECTIONS

- A. Section 22 11 23S - Water Pump
- B. Division 26 Electrical

1.3 REFERENCES

- A. The following are complete titles of references cited in this Section. The date of the standard is that in effect as of the certification date.
 - 1. American Water Works Association (AWWA)/American National Standards Institute (ANSI)
 - a. AWWA C504: Rubber-Seated Butterfly Valves
 - b. AWWA C508: Swing Check Valves for Waterworks
 - c. AWWA C512: Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service
 - d. AWWA C540: Power-Actuating Devices for Valves and Sluice Gates
 - 2. American Society for Testing Materials (ASTM)
 - a. ASTM A36: Standard Specification for Carbon Structural Steel
 - b. ASTM A126: Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
 - c. ASTM A536: Standard Specification for Ductile Iron Castings
 - 3. American National Standards Institute (ANSI)
 - a. ANSI B16.1 Cast Iron Pipe Flanges and Flanged Fittings
 - b. ANSI B16.10 Valves and Fittings
 - 4. National Sanitation Foundation (NSF)
 - a. NSF/ANSI 61: Drinking Water System Components – Health Effects
 - b. NSF/ANSI 372: Drinking Water System Components – Lead Content

1.4 SUBMITTALS

- A. Submit the following:
 - 1. Manufacturer's product data including (Type B Submittal):
 - a. Manufacturer's catalog data and detail construction sheets showing all valve parts and describing by material of construction, specifications (such as AISI, ASTM, SAE, or CDA), and grade or type.
 - b. Valve dimensions including laying lengths, port sizes, dimensions and orientation of valve actuators as installed on the valves, location of internal stops for gear actuators.
 - c. Manufacturer's catalog data and descriptive literature on valve linings, coatings, gaskets, seats, and seals.
 - d. Product datasheets for all pipe thread sealants/dope and plumbing tape that may be used.

1.5 DELIVERY, STORAGE, HANDLING

- A. CONTRACTOR shall be responsible for the delivery, storage, and handling of products.
- B. Load and unload all valves by hoists or skidding. Do not drop products. Do not skid or roll products on or against other products. Use slings, hooks, and pipe tongs in such a manner as to prevent damage to products.
- C. Store valves in accordance with manufacturer's recommendations.
- D. Keep stored products safe from damage or deterioration. Keep the interior of valves free from dirt or foreign matter. Drain and store valves in a manner that will protect valves from damage by freezing. Store gaskets and other products that will be deteriorated by sunlight in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products.

1.6 BASIS FOR COMPENSATION

- A. Compensation for all Work included under this Section shall be as set forth in Specification Section 01 22 00S, Measurement and Payment.

PART 2: PRODUCTS

2.1 GENERAL

- A. All pipe thread sealant/dope and plumbing tape used shall be free of per- and polyfluoroalkyl substances (PFAS).
- B. All valves shall be free of PFAS, including linings, gaskets, seats, and seals.
- C. All valves, fittings, gaskets, piping, and appurtenances shall have a minimum working pressure rating of 250 psi, except all valves, fittings, gaskets, piping, and appurtenances

on the discharge / pressure side of the pumps shall have a minimum working pressure rating of 350 psi. This will require special gaskets for flanged fittings (see AWWA C110 and AWWA C111).

- D. Use valves of a single manufacturer for each valve type where possible.
- E. Provide touch-up paint for factory-finished valves and actuators.
- F. Laying dimensions of flanged valves per ANSI B16.10.
- G. Flanges: ANSI B16.1 250 lb minimum unless otherwise noted or the working pressure is greater than 250 psi, in which case the flange class shall be equal to or greater than the working pressure (see 2.1.C immediately above).
- H. Clockwise rotation of operator to close valves when viewed from top of valve.
- I. Valves in contact with drinking water shall meet the requirements of:
 - 1. NSF/ANSI 61 certified for contact with drinking water
 - 2. NSF/ANSI 372 certified lead-free
- J. Where more than one material is listed for a particular service, select a single material for that service.

Service	Material	Valves
Water (greater than 4-inch diameter)	Ductile Iron (DI)	Gate except Butterfly valves for diameters greater than 12-inch
Water (4-inch diameter or less)	Ductile Iron (DI)	Ball
Air	As recommended by blower or air compressor supplier.	
Drains	Galvanized Steel (GS)	Ball
ARV Outlet	Polyvinyl Chloride (PVC)	None

2.2 CHECK VALVE

- A. Design: AWWA C508.
- B. Body: ASTM A126, Class B, or ductile iron body: ASTM A536, Grade 65-45-12.
- C. Cover: Steel ASTM A36.
- D. Furnished with outside lever, adjustable counterweight and non-pivoting air-cushion chamber.
- E. Manufacturers: Golden Anderson Figure 250, or ENGINEER-approved equal.

2.3 BUTTERFLY VALVES

- A. Design: Double Offset Eccentric, AWWA C504 Class 250 B with flanges per ASME B16.1 minimum, unless the working pressure is greater than 250 psi, in which case the Class shall be greater than or equal to the working pressure.
- B. Materials:
 - 1. Body: ASTM A126 Class B cast iron
 - 2. Seats: rubber body of one-piece construction
 - 3. Disc: stainless steel, or cast-iron with a stainless-steel edge
 - 4. Shaft: 304 or 316 stainless steel
- C. Operators: Manual or electric as indicated on the Drawings.
- D. Manufacturer: Henry Pratt, DeZurik, or OWNER-approved equal.
- E. Valves shall meet NSF/ANSI 61/372.

2.4 MANUAL VALVE OPERATORS

- A. Designed as an integral part of the valve.
- B. Torque capability: able to seat, unseat, and rigidly hold in any intermediate position the valve disc it controls under the pressure indicated by the valve manufacturer.
- C. 4-inch and smaller: lever.
- D. 6-inch and larger: handwheel.

2.5 ELECTRIC VALVE ACTUATORS

- A. Design: AWWA C540.
- B. Power: 120 volt, 1 phase, 60 Hz.
- C. For modulating valves, provide a 4 to 20 mA analog position indicator.
- D. Include motor, integral reversing starters, local controls and terminals for remote control and indication housed within a self-contained, sealed enclosure.
- E. Sized to guarantee valve closure at thrust requirement indicated by the valve manufacturer.
- F. Motor: Class F insulated, with a duty rating of at least 15 minutes at 104°F.
- G. Manual operation:
 - 1. Handwheel
 - 2. A seized or inoperable motor shall not prevent manual operation.
- H. Manufacturer: Rotork, AUMA or OWNER-approved equal.

2.6 BALL VALVES

- A. Metal – Used on metal piping only.
 - 1. Body: bronze
 - 2. Ball and stem: AISI 304 stainless steel
 - 3. Connection:
 - a. 4-inch and larger: flanged
 - b. Under 4-inch: threaded
- B. Provide manual T-handle or lever actuators for ball valves 4” and smaller.

2.7 GATE VALVE

- A. AWWA C509.
- B. Material:
 - 1. Iron body gate valve shall be of the resilient-seated, nonrising stem type and shall conform with AWWA C509. The disk shall be constructed of high-strength cast iron and fully encapsulated in an elastomer coating. The stems shall be constructed of solid bronze with precisely machined threads. Gate valve shall have flanged ends drilled and faced in accordance with ANSI B16.1, Class 250 minimum, unless the working pressure is greater, in which case the Class shall be greater than or equal to the working pressure. The gate valve shall be provided with O-rings above and below the thrust collar on the stem. Valves shall be furnished with a handwheel operator.
- C. Manufacturer: Clow, Mueller, or OWNER-approved equal.

2.8 PLUG VALVES

- A. AWWA C517
- B. Material:
 - 1. Body and Cover: Cast iron
 - 2. Plug: Ductile or Cast iron, solid, one piece
 - 3. Seat: Nickel (95% minimum), 1/8-inch thick, ½-inch wide
 - 4. Adjustable packing: Acrylonitrile-Butadiene (NBR)
- C. Pressure: 250 psi minimum and 350 psi minimum if on the pressure side of the ASR/Rock Canyon pumps.
- D. Manufacturer: DeZurik, or OWNER-approved equal.

2.9 AIR/VACUUM RELEASE VALVE

- A. AWWA C512
- B. Material:
 - 1. Body and Cover: ASTM A126 Class B
 - 2. Float: Stainless steel
 - 3. Seat: Buna-N and replaceable
 - 4. Other Internal Parts: Stainless steel
- C. Manufactured per ANSI/AWWA C512 and shall be Golden Anderson Series 930, Pratt Series WAR AirPro Max or OWNER-approved equal.

2.10 REDUCED PRESSURE ZONE (RPZ) BACKFLOW PREVENTER

- A. Valve ends flanged and drilled conforming to ANSI B16.1, Class 125.
- B. Cast iron body, ASTM A126.
- C. Rated for minimum 250 psi cold working pressure, unless on the pressure side of the ASR/Rock Canyon pumps, in which case the rated minimum working pressure shall be 350 psi.
- D. Pressure type vacuum breaker design; complete unit with the following features:
 - 1. Two independently acting spring-activated check valves providing a drip-tight closure against reversal of flow
 - 2. Opening to atmosphere on discharge side of second check valve
 - 3. Opening to atmosphere begins at no less than 1 psi positive pressure, fully open at atmospheric pressure
 - 4. Check valves close prior to reversal of flow
 - 5. Two shutoff valves for isolation
 - 6. Four test cocks to allow testing of each check valve
 - 7. All internal parts of check and air inlet valves field removable and replaceable
 - 8. Constructed of corrosion resistant material
 - 9. Cla-Val, Watts, or OWNER-approved equal

2.11 PUMP CONTROL VALVES

- A. Type: Globe type, hydraulically operated and diaphragm activated, with built-in lift type check feature.
- B. Materials: Ductile iron body and flanges per ASTM A536 and ASME B16.42 Class 300.
- C. Valve shall meet NSF/ANSI 61.

- D. RC/ASR System.
 - 1. Cla-Val 60-BT, with PC-22D electronic pump control panel, XP2F metering package, 10" valve size
- E. Intermediate System.
 - 1. Cla-Val 60-11, with PC-22D electronic pump control panel, XP2F metering package, 8" valve size

2.12 SURGE CONTROL VALVE

- A. Type: Pressure relief and surge anticipator valve. Globe-type, hydraulically operated and diaphragm activated, with built-in lift type check feature.
- B. Materials: Ductile iron body and flanges per ASTM A536 and Flanges per ASME B16.42.
- C. Valve shall meet NSF/ANSI 61.
- D. RC/ASR System.
 - 1. Cla-Val E-52-03, 8" valve size, Class 300, or OWNER-approved equal
- E. Intermediate System.
 - 1. Cla-Val E50-01, 4" valve size, Class 150 lb, or OWNER-approved equal

2.13 PRESSURE GAUGE

- A. Minimum pressure rating: 300 psi.
- B. Design: Liquid filled bourdon tube, AISI Type 316 stainless steel.
- C. Tube: Drawn C-tube.
- D. ½-inch NPT connection.
- E. Dial: 4.5-inch diameter and pressure range from 0 to 200 psi for Intermediate System. 0 to 300 psi for Rock Canyon System.
- F. Supplied with ½-inch NPT lower stem connections.

2.14 PRESSURE TRANSMITTERS

- A. Electronic generating 4-20 mAdc signal, linear with pressure, into 1000 ohms, isolated.
- B. Type 316 stainless steel diaphragm. Span and zero adjustments.
- C. Two-wire device deriving operating power from 4-20 mAdc loop.
- D. Process temperature: -40 to 250 deg F. Operating temperature: -20 to 60 deg F.
- E. Accuracy: 0.5% of calibrated span.
- F. Manufacturer: Rosemount 3051 Series or approved equal.

2.15 MAGNETIC FLOWMETER

- A. Electro-magnetic induction type producing pulsed DC signal proportional to flow, over a range of 0-15,000 gpm for ASR/RC System and 0 – 5,000 gpm for Intermediate System.
- B. Flow tube shall be suitable for potable water.
- C. Size as shown on the Drawings.
- D. Stainless steel metering tube, PTFE liner.
- E. Field replaceable metering tube, 350-pound ASA flanges.
- F. 316 stainless steel conical raised electrodes.
- G. Flow tube shall be suitable for accidental submergence.
- H. Stainless steel grounding rings shall be furnished with meter when used on nonmetallic pipe systems.
- I. Minimum operating temperature, 0 - 60 degrees C; relative humidity 20% to 100%, condensing.
- J. The flowmeter shall be integral with the flowmeter converter.
- K. Manufacturer: Rosemount 8700 Series or approved equal.

2.16 MAGNETIC FLOWMETER CONVERTER

- A. Magnetic flow-to-current converter shall be microprocessor based solid state type, using a pulsed DC signal to determine flow.
- B. Output shall be 4-20 mA_{dc} linear with flow into load of 0 to 1000 ohms, minimum, isolated signal. Range of flow will be 0-15,000 gpm. for ASR/RC System. Range of flow for Intermediate System shall be 0 – 5,000 gpm.
- C. Operating power shall be 120 volts, 60 Hz, +/- 3 Hz.
- D. Pulsed DC type shall include inherent zero.
- E. Minimum technical requirements:
 - 1. Accuracy: $\pm 1.0\%$ of calibrated span
 - 2. Repeatability: $\pm 0.25\%$ of calibrated span
 - 3. Supply effect: $\pm 0.25\%$ of calibrated span for $\pm 10\%$ power supply variation
 - 4. Temperature: $\pm 0.50\%$ of calibrated span over rated range
- F. NEMA 4X construction. The flowmeter converter shall be integral with the flow tube.
- G. Converter shall have an integral LCD display and pushbuttons to allow field selection of display range and units. Program unit to display in engineering units specified for each loop.
- H. Manufacturer: provide same as flowmeter.

PART 3: EXECUTION

3.1 GENERAL

- A. Make necessary field measurements to determine pipe laying lengths.
- B. Use fittings as shown on the Drawings.
- C. Provide sufficient flanged connections to permit easy dismantling of equipment and piping for maintenance.

3.2 INSTALLATION

- A. Install valves per manufacturer's recommendations.
- B. In general, install valves with stems upright or horizontal, but coordinate final actuator orientation with OWNER for ease of access.
- C. Install valves in the locations and configurations shown on the Drawings.
- D. Provide structural support as shown on the Drawings and sufficient to meet requirements of valve manufacturer.

3.3 STARTING AND ADJUSTING

- A. Furnish OWNER and ENGINEER with a written report prepared by equipment supplier certifying that equipment:
 - 1. Has been properly installed.
 - 2. Is in accurate alignment.
 - 3. Is free from an undue stress imposed by connecting piping, anchor bolts, etc.
 - 4. Has been operated through multiple complete open/close cycles.
 - 5. Has been checked for leakage.

3.4 DISSIMILAR PIPE CONNECTIONS

- A. Provide non-conducting connections or flange-insulating gaskets where dissimilar metal pipes are joined.

3.5 FIELD CLEANING

- A. Completely remove foreign material from interior of pipe, valves and appurtenances.
- B. Repair or replace equipment damaged by foreign material.

3.6 DISINFECTION

- A. Disinfect fully assembled process piping, including valves and other appurtenances, in accordance with AWWA 651 and applicable regulations.
- B. After disinfection, collect samples for bacteriological analysis and supply to OWNER.

3.7 FIELD TESTS

- A. Coordinate field testing and start-up with ENGINEER and OWNER.
- B. Pressure lines
 - 1. Test liquid piping systems with water in accordance with ANSI/AWWA C600 for pressure piping.
 - 2. Test all pressure piping lines at 250 psig.
 - 3. Inspect all joints for leaks after piping has been under pressure for 24 hours.
 - 4. Valve off or otherwise isolate instrumentation, controls or other piping accessories which may be damaged by test pressure.
 - 5. Provide test pumps, test plugs, blind flanges, pipe and gauges, and make required pipe connections as required to conduct pressure tests.
- C. Replace or repair defective pipe, fitting and valves disclosed during tests.
- D. Retest piping showing leakage.

END OF SECTION 22 11 14S

SECTION 22 11 23S

WATER PUMP

Delete Standard Specification 22 11 23 WATER PUMP in its entirety and replace it with the following.

PART 1 - GENERAL

1.1 WORK INCLUDED. This Section includes the furnishing, installation, testing and commissioning of vertical turbine pumps, discharge columns, shafting, discharge heads, motors and other types of pumps and appurtenant items.

1.2 RELATED WORK

Section 21 11 00S - Building Services Piping

Section 22 11 14S - Facility Valves and Actuators

Division 26 Electrical

1.3 REFERENCES

A. American Water Works Association (AWWA)

1. E101-88 Vertical Turbine Pumps - Line Shaft and Submersible Types

B. American National Standards Institute (ANSI)

1. B16.1 Flanges and Fittings for Cast Iron Pipe

C. American Society for Testing Materials (ASTM)

1. A48 Specification for Gray Iron Castings

2. A53 Specification for Pipe, Steel, Black or Hot-Dipped Zinc Coated, welded or seamless

1.4 SUBMITTALS

A. Preliminary Performance Curves shall be submitted for approval prior to manufacture of the pump. The curves shall be plotted on graph paper and shall indicate the head, brake horsepower, and overall efficiency over the range of discharges from shutoff to maximum, including the required points of operation.

- B. Shop Drawings, including illustrative Drawings, catalogs, and detailed descriptive information and data on the proposed pump and motor, shall be submitted for approval.
- C. Certified Test Curve. Certified performance test curves for the actual pump to be furnished shall be submitted based on the factory tests hereinafter specified. Approval of the certified test results shall precede the shipment of the pump from the factory.
- D. Operation and Maintenance Manual. Provide three (3) copies of complete operation and maintenance information for the pump and motor.

PART 2 - PRODUCTS

2.1 DESIGN CONDITIONS. The following are the anticipated operating conditions and related requirements

ASR/Rock Canyon System Vertical Turbine Pumps – Quantity 3

- Static Water Level Range(approx.) Elevation 4894.8 – 4834.8
- Design Point 3000 GPM @ 595 Ft. TDH,
- Minimum Discharge Diameter 10 inch
- Maximum Motor Horsepower 600 hp
- Motor Synchronous Speed 1800 rpm
- Motor Voltage 480 volt
- Nominal Minimum Motor Efficiency 95 %

ASR/Rock Canyon System Vertical Turbine Pumps – Quantity 1

- Static Water Level Range(approx.) Elevation 4894.8 – 4834.8
- Design Point 1500 GPM @ 595 Ft. TDH,
- Minimum Discharge Diameter 8 inch
- Maximum Motor Horsepower 300 hp
- Motor Synchronous Speed 1800 rpm
- Motor Voltage 480 volt
- Nominal Minimum Motor Efficiency 95 %

Intermediate System Vertical Turbine Pumps – Quantity 3

- Static Water Level Range(approx.) Elevation 4894.8 – 4834.8
- Design Point 1400 GPM @ 230 Ft. TDH,
- Minimum Discharge Diameter 8 inch
- Maximum Motor Horsepower 150 hp
- Motor Synchronous Speed 1800 rpm
- Motor Voltage 480 volt
- Nominal Minimum Motor Efficiency 95 %



2.2 VERTICAL TURBINE PUMP

- A. Pump Construction. Vertical turbine pump, with the exception of the motors, shall be the product of a single manufacturer. The turbine pump shall be enclosed impeller with high-grade enameled cast iron (ASTM A48-Class 30) bowls accurately machined, bronze or rubber bearings, and bronze impellers. Impellers shall be secured to a stainless-steel bowl shaft with stainless steel collets. Pump shall be manufactured by Goulds, Fairbanks Morse, Johnston, Layne-Bowler, or Peerless.
- B. Drive Shaft and Pump Column. The drive shaft shall be constructed of precision steel, ANSI Type 416SS, turned, ground and polished, straight and true within a tolerance of 0.005 inches in each 10-foot length with butt joints and stainless-steel couplings made of solid steel bar stock accurately threaded. The head shaft shall be 416 SS HT extending through the hollow shaft of the drive and connected to a drive plate. Thrust and radial bearings, positioned in the drive, are to provide support to the load and guide the shaft and are to be oil lubricated.

The discharge column shall be of sufficient size to carry the required volumes of water without undue friction losses. The column pipe shall be Schedule 40, seamless, low carbon steel pipe meeting ASTM A53, Grade B requirements. With exception of the top and bottom sections, the column shall be assembled in 10 ft. lengths. Threaded couplings shall be used. The spiders or bearing retainers are to be constructed of bronze and fitted with Goodrich or equal rubber bearings. The spiders shall be positioned at column joints and screw into the coupling for a watertight joint. The bearings shall be designed for water lubrication.

The lower end of bowl assembly shall be provided with a 10-foot length of suction pipe of weight and diameter equal to the column, and a bronze strainer shall be provided at the inlet.

- C. Discharge Head and Base. This shall be constructed of cast iron designed for above ground discharge and to suit the manufacturer's standard product. The discharge outlet shall be a long sweep elbow of the size specified with a standard flanged outlet to fit without adaption of the specified discharge diameter. The base of the discharge head shall be sealed to the leveling plate at top of the casing in a manner as shown on the Drawings. Provide drain holes around pump base.

The head shall be arranged for the mounting of a hollow shaft drive, equipped with a suitable thrust bearing. Furnish the necessary foundation bolts and other bolting required. The column shall be secured to the head casting with a flanged joint. Provide the necessary lubricating equipment of design standard to the manufacturer's product including a deep stuffing box packed with impregnated packing where the shaft enters the column. Discharge head shall be designed to permit unobstructed access to the stuffing box to facilitate easy repacking.

Lubricating water line shall be provided by the CONTRACTOR. The head shall be

provided with a water connection for shaft bearing lubrication.

The CONTRACTOR shall furnish between the top of the concrete foundation and the pump head casting a steel or cast-iron leveling plate of at least 1" thickness and area equal to or greater than the area of the pump head casting. The leveling plate construction details shall meet the requirements of the Minnesota Department of Health. The leveling plate shall be grouted in place on the top of the foundation after being carefully leveled.

Pump shall have a brass nameplate mounted in accessible location with manufacturer's name and the design characteristics imprinted thereon.

- D. Motor. The motor shall conform with applicable NEMA, IEEE and ANSI standards and shall be energy efficient having efficiency as scheduled in accordance with IEEE Standard 112, Test

The motor shall be a premium efficiency, vertical squirrel cage type, hollow shaft, suitable for 3-phase, 60 hertz, A.C. voltage, horsepower and a synchronous speed as hereinbefore specified. The motor shall be NEMA Weather-Protected Type I, normal torque, low starting current, 40 C ambient, 1.15 service factor, high thrust, ball bearing, low current starting, general purpose motor with moisture resistant windings. The motor shall be suitable for variable-frequency speed variation.

The rotor of the motor shall be dynamically balanced and free from objectionable vibrations. The motor shall be G.E. Energy Saver or equal. Motor shall be non-overloading when operating continuously over the entire operating range without using the service factor. A device shall be provided to prevent shaft reversal.

The motor shall have a brass nameplate mounted in an accessible location with the manufacturer's name and design characteristics imprinted thereon.

Electrical work shall be as specified in Division 26.

- E. Factory Performance Test. The pump to be furnished shall be factory tested to verify its conformity with the specified performance. The tests, conducted in accordance with the applicable provisions of the Hydraulic Institute's Test Code, shall cover the full range of operating conditions from shutoff to maximum discharge. Data shall be obtained for discharge vs. operating head, and corresponding brake horsepower and efficiency. The test curves shall be plotted with the capacities as abscissas against operating head, brake horsepower, and efficiency plotted as ordinates. The test results shall indicate conformity with the specifications at the design points within zero percent (0%) minus tolerance and ten percent (10%) plus tolerance. Failure of the pump to achieve the required performance shall require modification of the pump and retesting.

PART 3 - EXECUTION

3.1 VERTICAL TURBINE

- A. Pump Installation. The turbine pump, shafting, and discharge column shall be installed in the casing on a concrete foundation. The exposed surfaces shall be troweled with a cement wash to provide a smooth finish. Set a leveling plate over the top of the concrete base on which the pump discharge head is placed, as shown on the Drawings. The leveling plate shall be accurately leveled and grouted in place.

After the pump, shafting, discharge column, and electric motor are installed, the CONTRACTOR shall then connect the electric motor to the permanent electrical service to test the pump and place the pump in final operating condition. The costs incidental to this pump testing are to be included in the price bid for the pump installation. The CONTRACTOR shall accept the in the condition in which it was left by the CONTRACTOR and shall construct the pump foundation around the present casing to the elevation set by the ENGINEER. The casing will extend above the pumphouse floor elevation. This CONTRACTOR may have to shorten or extend the casing as necessary to place the sanitary seal for the discharge head. The placing of the sanitary seal shall be considered incidental to constructing the concrete base.

- B. Vertical Turbine Pump Disinfection. CONTRACTOR shall disinfect the vertical turbine bowl assembly, discharge column, shafting, and pump base with a standard solution of calcium hypochlorite solution as he installs the pump. Both the inside and outside of the discharge column shall be swabbed, with suitable swabs, just before installation by using a saturated solution of calcium hypochlorite.

Prior to setting the vertical turbine pump base, the CONTRACTOR shall prepare a chlorine solution for disinfecting the and pumping equipment. Chlorine shall be so applied that a concentration of 50 ppm of chlorine shall be obtained in all parts of the. The chlorine solution shall be introduced into the in a manner to flush the surfaces above the static water level with the chlorine solution. The solution shall remain in the for a minimum of two hours and then pumped to waste in a manner approved by the ENGINEER. The chlorine solution discharge shall not have any impact on the surrounding wetland.

- C. Vertical Turbine Field Tests. Field acceptance tests of the pumping equipment shall be conducted in the presence of the ENGINEER and the OWNER after the installation is completed. The CONTRACTOR shall furnish the necessary personnel and other equipment for conducting the field test. Capacity measurement shall be by using the measuring device installed in the discharge line under this contract. The testing equipment, its set-up, instruments, methods of conducting the test and the observations to be recorded shall be approved by the ENGINEER before the tests are made. Satisfactory evidence shall be given to the ENGINEER that the instruments which are used are accurate.

The vertical turbine pumps shall be tested for a period of one hour at its design capacity and head, the test being conducted in the presence of the ENGINEER and a representative of the OWNER. Readings of the instruments shall be taken at intervals of five (5) minutes for the drawdown, pumping head, flow rate and necessary data to determine the overall efficiency of the pumping unit, and recorded on log sheets. Four copies of the log sheets shall be turned over to the ENGINEER. If the OWNER or ENGINEER is dissatisfied for any reason with the tests, additional ones shall be conducted as the ENGINEER may direct.

Should the test indicate that the pump has failed to meet the required performance, the CONTRACTOR shall proceed at once to correct the same. After this has been done, additional tests shall be conducted at the CONTRACTOR's expense.

In the event the CONTRACTOR is unable to obtain the specified performance, the OWNER reserves the right to reject the pump or accept a reduction in the contract price for an amount satisfactory to the OWNER. Should the pump be rejected, the CONTRACTOR shall proceed at once in securing and installing another pump that will meet the specified performance without cost to the OWNER. In the event the CONTRACTOR shall repeat the pumping test as specified above, it shall be at no additional cost to the OWNER.

END OF SECTION 22 11 23S

SECTION 23 30 00S
HVAC AIR DISTRIBUTION

Add this Supplemental Specification to the Contract Documents.

PART 1: GENERAL

1.1 SUMMARY

- A. The scope of Work covered by this section includes furnishing labor, equipment, materials, and accessories, and performing operations necessary for the installation of sheet metal ductwork and accessories as shown on the Drawings and herein specified.

1.2 RELATED SECTIONS

- A. Section 23 62 23S - Packaged Water-Cooled Air Handling Units.
- B. Section 09 91 23S - Interior Painting.

1.3 SUBMITTALS

- A. Contractor shall submit Shop Drawings of the following products.
 - 1. Registers, grilles, and diffusers
 - 2. Louvers
 - 3. Air handling units
 - 4. Unit heaters

PART 2: PRODUCTS

2.1 DUCTWORK

- A. Construct heating and ventilating, ducts at locations as shown on plans. Dimensions given are nominal.
- B. Construct and support ductwork in accordance with standards for sheet metal construction as outlined in the latest issue of the ASHRAE guide and SMACNA guide for low pressure sheet metal duct system unless otherwise noted on the Design Drawings.

- C. Construct ductwork of galvanized sheet metal. Wall thickness and construction details shall be in accordance with requirements of SMACNA for rectangular and round low-pressure duct construction.
- D. Do not allow obstruction in ducts, except where shown on the Design Drawings or where absolutely necessary, in which case they shall be placed so as to least interfere with the passage of air.
- E. The centerline radius of rectangular elbows shall be equal to or greater than the width of the duct. Use turning vanes for square elbows.
- F. Transitions shall be made with a total angle of 60 degrees or less for contractions and 20 degrees or less for expansions.
- G. Use 45-degree entry tee for rectangular branch off rectangular main. Use conical type round branch off rectangular main. Do not use splitter damper or air extractor.
- H. Fastenings and hardware for galvanized ductwork and sheet metal ductwork shall be cadmium-plated and screws, bolts, and fastenings shall not penetrate the duct.
- I. Provide access door in ductwork adjacent to motorized and automatic dampers and as shown on the Design Drawings.
- J. Exposed ductwork and accessories shall be paint-grip-coated galvanized steel. Refer to Interior Painting Specifications 09 91 23S.

2.2 FLEXIBLE CONNECTIONS

- A. Flexible connections shall be heavy glass fabric double-coated with neoprene having a flame spread rating of not over 25 and a smoke developed rating of not over 50 and installed with the proper amount of slack to prevent noise and vibration transmission, Ventfabrics Ventglas, or equal.

2.3 REGISTERS, GRILLES, AND DIFFUSERS

- A. Registers, grilles, and diffuser model numbers as scheduled on the Drawings are Price industrial quality. Approved equivalent products will be accepted from Hart & Cooley (Tuttle & Bailey), Metal Aire, Krueger, Titus, or Carnes.

2.4 WEATHER LOUVER

- A. Actuated weather louver shall be Greenheck ECD-401 or approved equal from Robertson, Arrow, Louvers and Dampers, American Warming and Ventilating, Cesco, Industrial Louvers, or Penn.
- B. Louver size, actuators and accessories are specified on the design Drawings.

- C. Refer to Specification 08 91 00 for further details.

2.5 APPURTENANCES

- A. Furnish and install appurtenances not usually shown on the drawings but usually furnished with ductwork to provide a complete and operable system.

PART 3: EXECUTION

3.1 INSTALLATION

- A. Erect and install items in strict accordance with the drawings, specification, manufacturer's recommendations, and referenced standards. Make work square, plumb, straight, and true. Joints and intersections of metal shall be tight-fitting.
- B. Substantially support and brace ducts to prevent sagging and vibration. Vertical ducts shall be self-supporting. The Contractor shall furnish and install necessary structural steel supports for the ductwork.
- C. Run ducts in such a manner as to avoid structural steel, conduit, piping, and other equipment. Do not cut, drill, or weld existing structural members without the permission of the Engineer.
- D. Drill holes required for the attachment of work and for bolted connections. Punching or burning holes in the ductwork will not be allowed.
- E. Close duct openings as soon as installed, until registers or grilles are set, to prevent entrance of dirt and debris.
- F. Seal flanged joints with red rubber or silicone rubber sealer.
- G. Turning vanes shall be single thickness and installed at square turns in the duct with trailing edges properly aligned with sides of the duct.
- H. Vibration Isolation
 1. Support related fans and air-handling equipment on vibration isolator supports or hangers.
 2. Provide flexible duct connections at equipment inlets and outlets to reduce transmission of fan vibration and noise to ductwork.
 3. Fabricate smooth transitions and branch take-offs to minimize air turbulence and resulting noise generation.

4. Install turning vanes in square duct elbows.
- I. Low pressure ductwork must be sealed in accordance with Seal Class C as defined by the SMACNA low-pressure duct construction standards.
- J. Engineer reserves the right to slightly change the run of certain ducts without extra cost to Owner, if necessary, to avoid unforeseen interference.

3.2 CLEANING

- A. Before final acceptance of the duct systems, they shall be thoroughly cleaned of dust and debris.
- B. Open and thoroughly clean devices and enclosures.
- C. Protect ductwork at all times to prevent dust or dirt from accumulating.

3.3 TESTING, ADJUSTING, AND BALANCING (TAB)

- A. Contractor shall provide manually operated volume dampers in each branch takeoff after leaving main duct.
- B. Contractor shall furnish labor, materials, and equipment necessary for testing, adjusting, and balancing of duct systems including, but not limited to, the following:
 1. Examine each air distribution system to see that it is free from obstructions. Determine that dampers, registers, and valves are in a set or full open position; that moving equipment is lubricated, and that the required filters are clean and functioning. Perform any adjustments necessary for proper functioning of the system.
 2. Verify that equipment performs as specified. Adjust variable type drives, volume dampers, control dampers, balancing valves, and control valves as required by the TAB work.
 3. Adjust each register, diffuser, and terminal unit to handle and properly distribute the design airflow within plus or minus 10 percent of the specified quantities.
 4. Document the results of testing on standard report forms and submit 2 copies to the Owner prior to final approval.

END OF SECTION 23 30 00

SECTION 23 35 16S
ENGINE EXHAUST SYSTEMS

Add this Supplemental Specification to the Contract Documents.

PART 1: GENERAL

1.1 SUMMARY

- A. The scope of Work covered by this section includes furnishing labor, equipment, materials and accessories, and performing operations necessary for the installation of factory built exhaust system that is tested and listed by the Underwriters' Laboratories, Inc. for use with medium heat equipment burning gas, liquid or solid fuels, as described in NFPA-37 and NFPA-211, which produce exhaust flue gas temperatures not exceeding 1400°F under continuous operating conditions. Additionally, the vent system shall be U.L. 103 positive pressure tested and listed to 60 inches internal water column pressure.
- B. The U.L. listed fiber insulated exhaust system shall have skin temperatures that have been obtained by Underwriters Laboratories (UL) test procedures. The published surface temperatures shall be the result of the UL103 1000° Fahrenheit chimney test.

1.2 RELATED SECTIONS

- A. None.

1.3 SUBMITTALS

- A. Contractor shall submit Shop Drawings of the following products.
 - 1. Exhaust duct, fittings and accessories.

PART 2: PRODUCTS

2.1 CONSTRUCTION

- A. The double wall exhaust system shall have a 304 stainless steel inner liner (20 ga minimum) and an aluminized steel outer jacket (24 ga minimum). The materials and construction of the modular sections and accessories shall be as specified by the terms of the product's U.L. listing.
 - 1. Ceramic fiber insulation between the inner liner and outer jacket shall be a nominal four inches thick.



- B. This exhaust system shall be designed and installed to be gas tight and thus prevent leakage of combustion products into a building.
- C. Inner pipe joints shall be securely connected and sealed with factory supplied overlapping V-bands and appropriate sealant as specified in the manufacturer's installation instructions.
- D. Connections to silencers and expansion joints shall be made with matching flanges. Matching flanges shall be of the same size, bolt hole spacing and pressure rating as the flanges to which the connections are made.
- E. Wall penetrations shall be suitable for the specified roof construction and shall comply with the manufacturer's installation instructions.
- F. The exhaust system shall be designed to compensate for all flue gas induced thermal expansion.
- G. Product specification requirements shall be met by using Selkirk Commercial/Industrial Model IPS exhaust flue or equivalent as approved by the engineer. Equivalent submittals shall specify manufacturer's model number, and other pertinent identification, and attest that the alternate material is in compliance with all specification requirements.

PART 3: EXECUTION

3.1 INSTALLATION

- A. Inner pipe joints shall be sealed by use of factory supplied overlapping V bands and sealant as specified in the manufacturer's installation instructions.
- B. Wall penetrations shall be suitable for a noncombustible wall and shall be according to the manufacturer's detail drawings and installation instructions
- C. When installed according to the manufacturer's installation instructions, the exhaust piping and its supporting system shall resist side loads at least 1.5 times greater than the weight per foot of the piping for both horizontal and vertical portions of the system.
- D. The exhaust system shall be installed according to the manufacturer's installation instructions and shall conform to all applicable state and local codes.
- E. Provide all supports, guides, bellows type expansion joints, pressure relief valves, guy sections, guy tensioners, roof thimbles, roof flashings, storm collars and flip top terminations as required to provide a complete system per the manufacturer's installation instructions.

- F. The entire exhaust system from the muffler discharge to the termination point, including all accessories, except as noted, shall be from one manufacturer

PART 4: WARRANTY

4.1 WARRANTY

- A. The exhaust system shall be warranted against functional failure due to defects in material and manufacturer's workmanship for a period of 5 years from date of installation.
- B. The inner diameter of the exhaust system shall be verified by the manufacturer's computations. The computations used shall be technically sound, follow ASHRAE calculation methods and shall incorporate the specific flow characteristics of the inner pipe. The contractor shall furnish the exact operating characteristics of the engine(s) and muffler(s) to the factory representative.
- C. The manufacturer shall provide "to scale" drawings depicting the actual layout. The exhaust system shall be installed as designed by the manufacturer and in accordance with the terms of the manufacturer's warranty and in conjunction with sound engineering practices.

END OF SECTION 23 35 16S

SECTION 23 62 23S
PACKAGED WATER-COOLED AIR HANDLING UNITS

Add this Supplemental Specification to the Contract Documents.

PART 1 GENERAL

1.1 SUMMARY

- A. The scope of Work covered by this section includes furnishing labor, equipment, materials and accessories, and performing operations necessary for the installation of water cooled air handling units.

1.2 RELATED SECTIONS

- A. Section 23 30 00S - HVAC Air Distribution

1.3 SUBMITTALS

- A. Product Data: Literature shall be provided that indicates dimensions, operating and shipping weights, capacities, ratings, fan performance, filter information, factory supplied accessories, electrical characteristics and connection requirements. Installation, Operation, and Maintenance manual with startup requirements shall be provided.
- B. Shop Drawings: Unit drawings shall be provided that indicate assembly, unit dimensions, construction details, clearances and connection details. Computer generated fan curves for each fan shall be submitted with specific design operation point noted. Wiring diagram shall be provided with details for both power and control systems and differentiate between factory installed and field installed wiring.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Products shall be provided by the following manufacturers:

- 1. AAON



2. Substitute equipment may be considered for approval that includes at a minimum:
 - a. R-410A refrigerant
 - b. Variable capacity compressor with 10-100% capacity control
 - c. Direct drive supply fans
 - d. Double wall cabinet construction
 - e. Insulation with a minimum R-value of 13
 - f. Stainless steel drain pans

2.2 ROOFTOP UNITS

A. General Description

1. Packaged rooftop unit shall include compressors, evaporator coils, filters, supply fans, dampers, water-cooled condenser, electric heaters, and unit controls.
2. Unit shall be factory assembled and tested including leak testing of the DX coils, pressure testing of the refrigeration circuit, and run testing of the completed unit. Run test report shall be supplied with the unit in the service compartment's literature pocket.
3. Unit shall have decals and tags to indicate lifting and rigging, service areas and caution areas for safety and to assist service personnel.
4. Unit components shall be labeled, including refrigeration system components, and electrical and controls components.
5. Estimated sound power levels (dB) shall be shown on the unit ratings sheet.
6. Installation, Operation, and Maintenance manual shall be supplied within the unit.
7. Laminated color-coded wiring diagram shall match factory installed wiring and shall be affixed to the interior of the control compartment's hinged access door.
8. Unit nameplate shall be provided in two locations on the unit, affixed to the exterior of the unit and affixed to the interior of the control compartment's hinged access door.

2.3 CONSTRUCTION

- A. Unit insulation shall have a minimum thermal resistance R-value of 13.
- B. Unit construction shall be double wall with G90 galvanized steel on both sides and a thermal break.
- C. Unit shall be designed to reduce air leakage and infiltration through the cabinet. Cabinet leakage shall not exceed 1% of total airflow when tested at 3 times the minimum external static pressure provided in AHRI Standard 340/360.
- D. Access to filters, dampers, cooling coils, compressors, water-cooled condensers, and electrical and controls components shall be through hinged access doors.
- E. Unit shall be provided with base discharge and return air openings. All openings through the base pan of the unit shall have upturned flanges of at least 1/2 inch in height around the opening.
- F. Supply Fans
 - 1. Unit shall include direct drive, unhooded, backward curved, plenum supply fans.
 - 2. Blowers and motors shall be dynamically balance and mounted on rubber isolators.
 - 3. Motors shall be premium efficiency ODP with ball bearings rated for 200,000 hours service with external lubrication points.
 - 4. Variable frequency drives shall be factory wired and mounted in the unit.
 - 5. Motors shall include shaft grounding.
- G. Cooling Coils
 - 1. Evaporator Coils
 - a. Coils shall be designed for use with R-410A refrigerant and constructed of copper tubes with aluminum fins mechanically bonded to the tubes and galvanized steel end casings.
 - b. Coils shall be leak tested.
 - c. Coils shall be furnished with factory installed expansion valves.
- H. Refrigeration System
 - 1. Unit shall be factory charged with R-410A refrigerant.

2. Each refrigeration circuit shall be equipped with expansion valve type refrigerant flow control.

I. Condensers

1. Water-Cooled Condenser
 - a. All components in contact with cooling water shall be compatible with potable water and meet the requirements of NSF/ANSI 61: Drinking Water System Components.
 - 1) If components do not meet these requirements, notice shall be provided to the Owner and a variance approval obtained from the Authority Having Jurisdiction (AHJ) before installation.
 - b. Heat exchangers shall be stainless steel. Field piping connections shall be made at each plate heat exchanger within the condensing section of the rooftop unit.
2. Each heat exchanger circuit shall have a factory installed valve for water balancing.
3. Each heat exchanger circuit shall have a flow switch that shuts down the compressors if water flow to the condenser is interrupted.
4. Unit shall include factory installed head pressure control module and each heat exchanger shall include factory installed head pressure control valve.

J. Electric Heating

1. Unit shall include an electric heater consisting of electric heating coils, fuses and a high temperature limit switch, with capacities as shown on the plans.
2. Unit shall include 2 stages of capacity control.

K. Filters

1. Unit shall include 2 inch thick, pleated panel filters with an ASHRAE MERV rating of 8, upstream of the cooling coil.
2. Unit shall include a clogged filter switch.

L. Outside Air/Economizer

M. Controls

1. Factory Installed and Factory Provided Controller

- a. Unit controller shall be capable of controlling all features and options of the unit. Controller shall be factory installed in the unit controls compartment and factory tested. Controller shall be capable of standalone operation with unit configuration, setpoint adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling available without dependence on a building management system.
2. Single Zone VAV Controller
 - a. Unit shall utilize a variable capacity compressor system and a variable speed fan system to modulate the cooling and airflow as required in meeting the space temperature needs and to save unit operating energy. Unit fan speed shall modulate based on space temperature, not supply air pressure.
 - b. Unit shall be provided with supply air temperature control. Mixing boxes and bypass ducts shall not be required for operation as a single zone VAV system.

N. Accessories

1. Unit shall be provided with a smoke detector sensing the return air of the unit, wired to shut off the unit's control circuit.

O. Curbs

1. Curbs shall be fully gasketed between the curb top and unit bottom with the curb providing full perimeter support, cross structure support and air seal for the unit. Curb gasket shall be furnished within the control compartment of the rooftop unit to be mounted on the curb immediately before mounting of the rooftop unit.
2. Curb shall be fully lined with 1 inch fiberglass insulation and include a wood nailer strip. (Curb shall be adjustable up to 3/4 inch per foot to allow for sloped roof applications.)

PART 3 EXECUTION

3.1 INSTALLATION

- A. Installation, Operation, and Maintenance manual shall be supplied with the unit.
- B. Installing contractor shall install unit, including field installed components, in accordance with Installation, Operation, and Maintenance manual instructions.

- C. Start up and maintenance requirements shall be complied with to ensure safe and correct operation of the unit.

PART 4 WARRANTY

4.1 WARRANTY

- A. Manufacturer shall provide a limited “parts only” warranty for a period of 12 months from the date of equipment startup or 18 months from the date of original equipment shipment from the factory, whichever is less. Warranty shall cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer’s written instructions for Installation, Operation, and maintenance have been followed. Warranty excludes parts associated with routine maintenance, such as belts and filters.

END OF SECTION 23 62 23S

SECTION 26 00 00S
ELECTRICAL GENERAL REQUIREMENTS

Delete Standard Specification 26 00 00 ELECTRICAL GENERAL REQUIREMENTS in its entirety and replace it with the following.

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes general provisions related to the electrical work. The provisions of this Section combined with the accompanying Drawings outline the scope of the electrical work.
- B. The Work includes providing all required labor and materials for a complete and operable electrical system as indicated on the accompanying Drawings and as required by the Contract Documents inclusive of all appurtenances not specifically shown or covered by the Specifications but required for complete operation of the electrical system as defined in the documents. The Work shall also include the testing, adjustment, start-up, and troubleshooting of the electrical equipment and the training of OWNER's operating personnel in its operation and maintenance.
- C. It shall be the responsibility of CONTRACTOR to provide a complete and fully operating system. CONTRACTOR shall be responsible for all details that may be necessary to properly install, adjust and place in operation the complete installation. CONTRACTOR shall assume full responsibility for additional costs that may result from unauthorized deviations from the contract documents.

1.2 REFERENCES

- A. The following are complete titles of references cited in this Section. The date of the standard that is in effect as of the certification date.
 - 1. National Fire Protection Association (NFPA)
 - a. NFPA 70: National Electrical Code (NEC) Latest edition

1.3 VERIFICATION OF DRAWINGS

- A. The Drawings indicate the required size of conduit and cable for wiring to be verified by the CONTRACTOR. The locations of equipment shall be verified in the field by CONTRACTOR. In the event it should become necessary to change the location of any work due to interference with other work, consult with ENGINEER before making any changes. CONTRACTOR shall determine and be responsible for the proper location and character of all anchor bolts, inserts, hangers, sleeves, cable tray, conduit, etc. for the electrical equipment, unless specifically detailed otherwise. Any discrepancies on Drawings need to be discussed with ENGINEER.

1.4 NAMEPLATES

- A. Each piece of equipment shall have a standard nameplate securely affixed in a conspicuous place, showing the manufacturer, model number and serial number as applicable. The nameplate of the distributing agent only will not be acceptable.

1.5 QUALITY

- A. All Work shall be installed by skilled Electrician in a neat and workmanlike manner and shall be approved by ENGINEER before final acceptance by OWNER.
- B. If equipment is furnished having power and control requirements other than as specified, make all necessary changes and furnish a complete set of Drawings for installing the alternate equipment. The installation shall comply with the requirements of the 2017 edition of the National Electrical Code, local and state codes and ordinances. Where the contract documents call for workmanship or materials in excess of code requirements, the project manual shall take precedence. Electrical equipment and materials shall be Underwriter's Laboratory approved, where UL standards for such products exist.
- C. All equipment to be installed on the project shall be new and unused. Existing equipment, if applicable, shall be reused only after obtaining written permission from ENGINEER.

1.6 WARRANTIES

- A. See General and Supplemental Conditions and Division 01.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

- A. The following items shall be included in the Work to be done:
1. All Work shall be under the direct supervision of a master electrician.
 2. Furnish permits as required for electrical construction. Pay all electrical inspection charges for the construction.
 3. Provide all power and control conduit and cable.
 4. Provide the ground system and complete all grounding connections.
 5. Provide electrical equipment as specified in accordance with the manufacturer's recommendations, instructions and directions. All equipment shall be properly protected during construction. All specified electrical equipment to be verified by CONTRACTOR.
 6. Complete all connections and test-operate the equipment in cooperation with OWNER, ENGINEER and others working on the project.
 7. Provide temporary wiring for construction use including ground fault protection in accordance with the 2017 National Electrical Code.

3.2 INSPECTION

- A. Inspect all the electrical equipment and notify ENGINEER in writing before the equipment is installed if the equipment appears to be deficient in fit, form, or function.

3.3 CONSTRUCTION

- A. CONTRACTOR, under this portion of the contract, shall be responsible for all cutting, patching, excavation, backfill, sleeves, chases, openings, etc. for equipment specified in this portion of the contract documents or for cable and conduit and associated electrical equipment that is specified in this portion of the contract documents to serve equipment that is provided by a different portion of these documents. If CONTRACTOR provides equipment that has power and control requirements that are different from those

specified, then that CONTRACTOR shall be responsible for any additional costs incurred for engineering, construction and all wiring changes required to make the alternate equipment perform per the intent of the contract documents.

- B. All patching, cutting, etc. shall have a finish that is compatible with the final finish of the remainder of the surface and shall meet with the approval of ENGINEER. All Electrical penetrations to be sealed.

3.4 EXISTING EQUIPMENT

- A. Any existing equipment that is removed, abandoned or disconnected shall remain the property of OWNER unless OWNER directs, in writing, that the equipment be surrendered to another party.
- B. Dispose of any equipment at OWNER's direction. The disposal of the equipment shall be to an OWNER's vehicle, or CONTRACTOR shall promptly remove the equipment from the site if OWNER surrenders it to CONTRACTOR.

END OF SECTION 26 00 00S

SECTION 26 05 00S

COMMON WORK RESULTS FOR ELECTRICAL

Delete Standard Specification 26 05 13 CONDUCTORS AND CABLES in its entirety and add this Supplemental Specification to the Contract Documents..

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Work covered under this Section includes providing all materials, equipment and labor to construct a complete wiring system including conductors, cable, conduit, boxes, fittings, devices and related equipment.
- B. The provisions of this Section combined with the accompanying Drawings outline the scope of the electrical work.

1.2 REFERENCES

- A. National Fire Protection Association (NFPA):
 - 1. NFPA 70 - National Electrical Code (NEC), latest edition
- B. Underwriter's Laboratories (UL)
 - 1. UL5 - Surface Metal Raceways and Fittings
 - 2. UL50 - Cabinets and Boxes
 - 3. UL83 - Thermoplastic Insulated Wire
 - 4. UL360 - Liquid-Tight Flexible Steel Conduit
 - 5. UL514 - Outlet Boxes and Fittings
- C. National Electrical Manufacturer's Association (NEMA)
 - 1. NEMA 250 - Enclosures for Electrical Equipment
 - 2. NEMA WD1 - Wiring Devices

1.3 QUALITY ASSURANCE

- A. All material shall meet the requirements of the National Electrical Code (N.E.C.), National Electrical Manufacturers Association (NEMA) specifications and local codes and ordinances, and shall be Underwriter's Laboratories listed, where U.L. standards for such products exist.

1.4 SUBMITTALS

- A. Submit technical data in conformance with Section 01 33 00S on:
 - 1. Conductors (all kinds)
 - 2. Signal cable
 - 3. Conduit, boxes and fittings (all kinds)
 - 4. Devices
 - 5. Wire identification

PART 2 PRODUCTS

2.1 CONDUCTORS COPPER - 600V

- A. Conductors shall be of soft drawn, annealed copper, having a conductivity of not less than 98% of pure copper. Conductors shall be NEMA Class B stranded. The conductors shall conform to ICEA and NEMA standards.
- B. The minimum size for power wiring shall be #12 AWG copper, unless shown otherwise. All conductor sizes are based on copper with XHHW insulation rated at not less than 90 deg C and suitable for wet and dry locations unless noted otherwise.
- C. All circuits shall be installed using wire with 600V XHHW insulation, unless wire with a different voltage rating is indicated. The insulation, as a minimum, shall have a conductor rating of not less than 90 deg C in both wet and dry locations. All cable shall have the same type of insulation by the same manufacturer throughout the project. Insulation shall meet all applicable NEMA and ICEA standards.
- D. All conductors shall be stranded.

2.2 SIGNAL CABLE

- A. Signal cable shall meet the following requirements: The conductors shall be not less than 16 gauge, 7 strand min., Class B, tin coated concentric bare copper wire with a 15 mil (nominal) 90 deg. C PVC primary insulation. The conductors shall be shielded with .35x5 mil (min.) 100% coverage aluminum or copper mylar tape shield, or equal, and an 18-gauge strand copper wire drain wire. The outer jacket shall be 20 mils (nominal) 75 deg. C PVC suitable for wet or dry locations.

2.3 WIRE IDENTIFICATION

- A. Each power, control and signal conductor shall be identified by plastic tags permanently attached to the cable. The tags shall be attached to each cable at each termination and wherever the cable is accessible in junction or pull boxes. Tags shall be marked with printing showing:

1. The circuit number from the cable and conduit schedules; and
 2. The terminal number as assigned by the equipment manufacturer.
- B. The cable marking system shall use transparent tape with a white area where the numbering shall be typed using a typewriter, as manufactured by:
1. Raychem
 2. Thomas & Betts
 3. Brady

2.4 CONDUITS, FITTINGS, BOXES AND DEVICES

- A. These specifications apply to all above-ground conduit and interior conduit (e.g. – conduit in the equipment room).
- B. CONTRACTOR shall supply cable tray, conduit, couplings, connectors, junction boxes, fittings and all other required items for a complete raceway system. The conduit fills indicated in the contract documents are based on copper conductors with THWN insulation suitable for 90 deg C insulation in both wet and dry locations. CONTRACTOR shall resize conduits for other conductor and/or insulation systems, if approved. The conduit shall be reamed and cleaned and made free of burrs. Exposed conduit runs shall be straight and true with the building lines and elbows, bends and offsets shall be uniform and symmetrical. All conduit runs shall be installed with adequate means for drainage provided at the low points.
- C. Rigid Steel Conduit:
1. All conduit shall be galvanized rigid steel unless specifically noted otherwise.
 2. The conduit used shall be hot dipped galvanized, including the threads. Unless specified otherwise the conduit shall not be smaller than 3/4". The conduit shall bear the U.L. label.
 3. Job site threading need not be galvanized. However, job site threading shall be painted with oil base primer to prevent oxidation of the threads.
 4. The use of threadless connectors with rigid steel conduits is not acceptable.
 5. Intermediate metal conduit shall not be acceptable.
 6. All supporting hardware, clamps, anchors, etc. shall be Type 316 stainless steel.
- D. PVC Conduit:
1. Unless otherwise indicated on the Drawings, CONTRACTOR shall furnish and install Schedule 40 PVC conduit underground or embedded in concrete. In certain cases as indicated, Schedule 80 PVC shall be utilized. The conduit shall be supported as recommended by the manufacturer or as required by applicable codes and ordinances, whichever is the more stringent. The conduit shall be composed of high impact PVC and shall be rated for 90 deg C wire. The conduit shall be listed for underground, encased, and exposed applications. The PVC conduit system

shall contain fittings for connecting the system to junction boxes and other devices as required.

2. Wherever a PVC conduit system is used CONTRACTOR shall furnish and install copper ground conductors. The conductors shall be continuous with no splices or joints unless permitted by the National Electrical Code. The size of the ground conductor shall be as required by the National Electrical Code or as shown on the Drawings, whichever is more stringent.
3. The duct shall bear the U.L. label.
4. The conduit shall not be smaller than 3/4".

E. Continuous Polyethylene (PE) Duct:

1. Continuous high-density polyethylene (HDPE) duct may be used in place of Schedule 40 PVC underground duct where conduits are to be installed using directional boring method. See Part 3 of this Section.
2. PE duct shall have Schedule 40 (nominal) wall thickness and shall bear U.L. label for use as underground electrical duct.

F. Flexible Sections:

1. Unless equipment is factory wired, the conduit system shall be joined to the equipment with waterproof flexible metallic conduit. The conduit shall be cold rolled steel, galvanized strip shall meet the requirements of a one-minute Preece dip test. The galvanized flexible conduit shall be covered with 40 mils \pm 5 PVC coating. The tensile strength of the PVC shall exceed 1600 psi. The flexible conduit shall be connected to the equipment and conduit system with waterproof, oil proof and dustproof connectors which are designed for use with the flexible conduit installed. All flexible conduit and fittings shall be U.L. approved. The minimum and maximum lengths of flexible connectors shall be sixteen (16) and thirty (30) inches, respectively. The flexible conduit shall not be used for grounding equipment. A separate conductor in accordance with N.E.C. Section 250 shall be installed inside the flexible section.

G. Boxes Cast:

1. Outlet and junction boxes shall be of the weatherproof, galvanized cast, ferrous alloy type with threaded hubs for use with rigid steel conduit. The boxes shall bear the U.L. label.
2. In areas where aluminum rigid metal conduit is used, the boxes shall be copper-free aluminum.
3. Manufacturer/Style:
 - a. Crouse-Hinds Type FS
 - b. Appleton Type FS
 - c. Or equal

H. Handholes:

1. Handholes shall be in-grade composite type with non-slip, secured covers with labelling "ELECTRICAL" on cover. Color of covers shall generally match color of surrounding surfaces (e.g. – green where installed in lawn areas), unless otherwise indicated. Handholes shall be provided as indicated on the Drawings. Provide stainless steel tamper-resistant screws to secure handhole cover.

I. Wiring Devices Specification Grade:

1. Wiring devices shall be AC quiet, NEMA specification grade, heavy duty unless otherwise specified. All devices shall meet Federal Specification W G 596E and W S 896E NEMA standard WD 1 4 and shall be listed by the Underwriter's Laboratories. The voltage rating shall be as required for the application. The devices shall have an ampacity of not less than 20 amps.
2. Toggle switches shall be 2-pole, to enable interlocking of mechanical equipment as indicated on Drawings.
3. Wall plates shall be Type 316 stainless steel. All switches, other than lighting switches, shall have an engraved label identifying the function of the switch and switch positions.
4. Where applicable, devices located in hazardous areas or areas where adverse conditions exist, shall meet NEMA and National Electrical Code requirements for those areas. Exterior receptacles shall include in-use weatherproof covers, extra-heavy-duty die-cast as manufactured by Intermatic or approved equal.

J. Switch Labels

1. All switches, other than lighting switches, shall have an engraved label identifying the function of the switch and switch positions. Labels shall be Type 316 stainless steel, or engraved laminated plastic, attached with screws.

PART 3 EXECUTION

3.1 INSTALLATION

- A. CONTRACTOR shall furnish, install, wire and start up equipment as required by the contract documents. The manufacturer's installation recommendations shall be observed, and the completed assembly shall meet applicable code requirements.

3.2 CONDUCTOR INSTALLATION

- A. Conductors shall be installed using industry accepted techniques as defined by Underwriter's Laboratories, National Electrical Code, NEMA, ICEA, and other applicable standards. CONTRACTOR shall use approved pulling compound where applicable.

- B. No splices shall be made in power wiring except in junction boxes. Conductors shall be continuous from outlet to outlet.
- C. No splices shall be made in signal or control conductors. The wiring shall be continuous from device to device.
- D. All wire and cable shall be tested for grounds and continuity before the circuit is energized. CONTRACTOR shall assume full responsibility for damage done to the equipment due to circuit grounds or open circuits.
- E. All power circuits shall be megged in the presence of the ENGINEER prior to placing in operation. The branch circuiting shall be megged to 500 VDC and shall demonstrate no less than 100 megohms of resistance. Those with less than this level shall be replaced at no additional cost to OWNER.

3.3 CABLE SPLICES

- A. Power cables or control circuit cables that are spliced in locations that are subject to damp or wet locations shall be spliced using 3M cast splice kits, or equal.

END OF SECTION 26 05 00S

SECTION 26 20 00S
LOW VOLTAGE ELECTRICAL TRANSMISSION

Add this Supplemental Specification to the Contract Documents.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Work covered under this Section includes providing all materials, equipment, and labor for construction of switchgear, panelboards and transformers.
- B. The provisions of this Section combined with the accompanying Drawings outline the scope of the electrical work.

1.2 REFERENCES

- A. National Fire Protection Associates (NFPA)
 - 1. NFPA 70 National Electrical Code (NEC), latest edition
- B. National Electrical Manufacturer's Association (NEMA)
 - 1. NEMA 250 Enclosures for Electrical Equipment
 - 2. NEMA PB 1 Panelboards
 - 3. NEMA ST-20 Dry-Type Transformers for General Applications
- C. Underwriter's Laboratories (UL)
 - 1. UL 67 Panelboards
 - 2. UL 50 Cabinets and Boxes
 - 3. UL 1561 Dry-Type General Purpose and Power Transformers

1.3 MAIN SERVICE

- A. Two new transformers will be used for this project. CONTRACTOR shall supply and install all items including conduit and concrete pads, the transformers and cable to the transformers supplied by Provo City Power.

1.4 SUBMITTALS

- A. Shop Drawings and technical data including:
 - 1. Service Entrance, Switch Gear, Distribution Panels, MCC

2. Panelboards (include schedule of circuit breakers)
3. Generator, Transfer Switch, etc.

PART 2 PRODUCTS

2.1 PANELBOARDS

- A. Unless shown otherwise, the bussing shall be suitable for 200 amps, minimum. The number of circuits shall be not less than indicated on the schedules shown on the Drawings. Unless shown otherwise, panelboards shall be NEMA 1. All panelboards on the project shall be by the same manufacturer, shall bear the U.L. label and listed as "suitable for use as service equipment" where applicable.
- B. Cabinet rough in boxes shall be code gauge steel, zinc galvanized, on both inside and outside surfaces, with an in-turned flange on all sides of the front. The front covers shall be sheet steel, with a rust inhibitor primer and a baked enamel finish for surface mounted panels. The front covers shall be fitted with a door with a continuous butt type hinge concealed and welded to the back of the door. The other three sides shall have door stops. Doors over 48 inches high shall have auxiliary fasteners at the top and bottom. The doors shall have locks with two keys per lock. When the front cover and door assembly is removed, access to the wiring gutters shall be provided. The sub plate shall be fastened to the panel board with screws. The entire panelboard shall be of dead front construction. The trim shall be adjustable.
- C. Where no main overcurrent protective device is scheduled, CONTRACTOR shall provide panelboards with main lugs only. Panelboard bussing shall be braced at equal to the interrupting rating of the largest branch overcurrent device in panelboards with main lugs only. The panelboard neutral shall have solderless connectors numbered not less than the number of branch circuits and available spaces in the panelboard. All spaces shall be connected to alternate phases.
- D. Unless otherwise shown, main and branch circuit breakers rated at 208 or 240 volts shall have an interrupting rating of not less than 14,000 amps, r.m.s., sym. Unless otherwise shown, main and branch circuit breakers rated at 480 volts shall have an interrupting rating of not less than 30,000 amps. r.m.s., sym. Where panelboards and breakers are UL labeled for the application, series rated main and branch breakers may be used. Circuit breakers shall indicate open, closed, or trip conditions by handle position. Circuit breakers shall be quick make, quick break with thermal magnetic trips having long time and instantaneous tripping characteristics. Multi pole breakers shall have one handle with internal trip bar with the circuit breaker cases fastened together. Panelboards with breakers with an interrupting rating of 14,000 amps or less, may be plug in. Other panelboards are to be of bolt on circuit breaker construction.
- E. Where required the panelboards shall contain ground fault interrupting circuit breakers. The breakers shall have an interrupting rating of not less than 10,000 amps, r.m.s., sym. The breakers shall have a sensing circuit capable of tripping the breaker in not more

than 30 milliseconds at a current imbalance of 5 mA. The breaker shall contain a sensing circuit test feature.

- F. Install closure plates in each space not occupied by a breaker where the knockout has been removed. Accurately list the circuit numbers on the panelboard schedule utilizing a typewriter.

2.2 DISTRIBUTION TRANSFORMERS

- A. Transformers shall be dry type suitable for indoor or outdoor service as shown on the Drawings. Transformers shall have a basic impulse level of not less than 10 kV. Transformers shall have not less than one 2.5% full capacity above normal primary voltage and two 2.5% full capacity below normal primary voltage taps. Sound level may not exceed 45 dB determined in accordance with procedures outlined with NEMA and ANSI standards. The transformers shall have a kVA rating as shown on the Drawings. The transformers shall have insulation suitable for NEMA Class H, 150 deg C. The transformer, at full load, shall have a temperature rise not exceeding 115 deg C over a 40 deg C ambient. The transformers shall be U.L labeled for 115 deg C operation.
- B. Transformers shall be constructed in accordance with NEMA and ANSI standards. The transformers shall be finished with one coat of rust inhibiting primer and two finish coats of paint.
- C. Transformers shall comply with U.S. Department of Energy 2016 efficiency requirements.

2.3 GROUNDING MATERIALS

- A. The entire installation shall be grounded in accordance with the National Electrical Code and as otherwise detailed.

PART 3 EXECUTION

3.1 GENERAL

- A. Panelboards shall be mounted with the top of the panelboard at 72 inches above finish floor.
- B. Field verify available space prior to ordering equipment. Limited space is available, field coordinate.

END OF SECTION 26 20 00S

SECTION 33 05 05S
DUCTILE IRON PIPE

Add this Supplemental Specification to the Contract Documents.

Delete Section 2.1.A.3 in its entirety and replace it with the following:

3. All fittings shall have a pressure rating that is equal to or greater than the working pressure indicated on the Drawings. Fittings shall have AWWA C110 joints. For flanged fittings (e.g., in Booster Station where the working pressure is 350 psi) special gaskets will be required (see AWWA C110 and C111).

Add the following at the end of Section 2.1.A:

7. Restrained joints shall be rated for the working pressure stated on the Drawings or a greater pressure. Restrained joints shall be American Ductile Iron Pipe Fastite Joint Pipe with the Fast-Grip Gasket, McWane Ductile TR Flex Restrained Joint, or OWNER-approved equal.
8. Seismic restrained joints shall be rated for the working pressure stated on the Drawings or a greater pressure. Seismic restrained joints shall be American Ductile Iron Pipe Earthquake Joint System, McWane Ductile Seismic Flex Coupling System, or OWNER-approved equal.

END OF SECTION 33 05 05S

SECTION 33 08 00S
COMMISSIONING OF WATER UTILITIES

Add this Supplemental Specification to the Contract Documents.

Add the following at the end of Article 1.2:

- C. AWWA Standards
 - 1. AWWA C600 Installation of Ductile-Iron Mains and Their Appurtenances

Delete Article 3.6 in its entirety and replace it with the following:

3.6 EXFILTRATION TEST

- A. Hydrostatic Testing: CONTRACTOR shall conduct hydrostatic tests in accordance with AWWA C600 except the test pressure shall be no less than 200 psi as measured at the highest elevation in the test section and the test acceptance criteria shall be no loss of pressure in 2 hours.
- B. Locate and repair all leaks and retest until the test acceptance criteria is met.

END OF SECTION 33 08 00S

SECTION 33 12 16S
WATER VALVES

Add this Supplemental Specification to the Contract Documents.

Delete Section 2.1.G in its entirety and replace it with the following:

- G. Minimum Rated Working Pressure: 250 psi, except provide valves with a greater working pressure if a greater working pressure is indicated on the Drawings.

Add the following to the end of Section 2.3:

- E. Butterfly valves shall be the double-offset, eccentric type.

END OF SECTION 33 12 16S

SECTION 33 12 19S
HYDRANTS

Add this Supplemental Specification to the Contract Documents.

Delete the first paragraph of Section 2.1.B in its entirety and replace it with the following:

Cast-iron compression type, opening against pressure and closing with pressure, base valve design, 250 psi minimum working pressure or the working pressure indicated on the Drawings, whichever is the greater pressure, with 1/4-inch diameter minimum tapping, and bronze plug in standpipe.

Delete Section 2.1.B.8 in its entirety and replace it with the following:

8. Pressure: 250 psi minimum working pressure or the working pressure indicated on the Drawings, whichever is greater. 300 psi hydrostatic test pressure.

Delete Sections 2.2.B, 2.2.C, and 2.2.D in their entirety.

END OF SECTION 33 12 19S

**APWA P-511S
FIRE HYDRANT WITH VALVE**

Add this Supplemental Specification to the Contract Documents.

Delete the last (bottom) row of the Legend on APWA Utah Chapter Standard Plan 511 in its entirety and replace it with the following:

(D)		TEE WITH 350# FLANGES THIS WILL REQUIRE SPECIALLY DESIGNED GASKETS	AWWA C110
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END OF SECTION APWA P-511S

P-511S
FIRE HYDRANT

Add this Supplemental Specification to the Contract Documents.

Delete the text on the end of the leader that points to the 6" fire hydrant lead on Provo Public Works Standard Detail P-511 in its entirety and replace it with the following:

6" DUCTILE IRON PIPE HAVING THE SAME PRESSURE CLASS OR PIPE WALL THICKNESS CLASS AS THE ADJACENT WATER MAIN.

END OF SECTION P-511S

PROJECT PLANS