00 01 01
TITLE PAGE

MAPLETON BIKE PARK PROJECT 2026

CONTRACT DOCUMENTS

Mapleton Bike Park Project
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Logan Miner – Parks and Recreation Director
1405 West 1600 North
Mapleton, UT 84664

A pre-bid meeting will be held at the Mapleton City Offices (125 W 400 North)
Tuesday, February 24th, 2026 @ 2:00 pm.

Bids will be received through the Utah Public Procurement Place – Bonfire (U3P-Bonfire), until
Thursday, March 12th, 2026 @ 3:00 pm

MAPLETON
UTAH

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APPENDICES

REFERENCE SPECIFICATIONS

1. 2026 Manual of Standard Specifications by the Utah Chapter of the American Public Works Association
2. Public Works Design Standards – Design Standards and Standard Specifications by Mapleton City Public Works (latest edition)
3. Standard Specifications for Road and Bridge Construction - Utah Department of Transportation (latest edition)

DRAWINGS

REFERENCE DRAWINGS

1. 2026 Manual of Standard Plans by the Utah Chapter of the American Public Works Association
2. Public Works Design Standards – Standard Plans by Mapleton City Public Works (latest edition)
3. Standard Drawings for Road and Bridge Construction - Utah Department of Transportation (latest edition)

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INVITATION TO BID

PART 1 GENERAL

1.1 CONSTRUCTION CONTRACT

A. Bidders are invited to bid on the Construction Contract titled:

Mapleton Bike Park Project 2026

B. This project advertisement is issued by:

Owner: Mapleton City Corporation

Project Manager: Logan Miner

Title: Parks & Recreation Director

Date: February 10, 2026

1.2 DESCRIPTION OF WORK

A. The WORK to be performed primarily includes, but is not limited to, construction of the Mapleton Bike Park on city-owned land near Harmony Ridge Parkway in Mapleton City. The work includes:

1. Site preparation, grading, and drainage improvements
2. Asphalt parking areas, concrete curb & gutter, concrete flatwork, and paved trails
3. Water services, sewer services, and electrical improvements
4. A restroom building
5. Landscaping and irrigation systems
6. Asphalt pump tracks, mountain bike trails, and multi-use trails

B. See Summary of Work (Document 01 11 00S) for additional details.

1.3 OBTAINING BID DOCUMENTS

A. Information and Bid Documents for the Project can be found at and downloaded from the Utah Public Procurement Place - Bonfire Portal (U3P-Bonfire). Neither the OWNER nor the ENGINEER will be responsible for Information or Bid Documents obtained from sources other than the designated website. To view this opportunity or set up an account with Bonfire, visit: https://utah.bonfirehub.com/portal/?tab=openOpportunities

1.4 INSTRUCTION TO BIDDERS

A. Electronic bids will be received until 3:00 P.M. ON THURSDAY, MARCH 12TH, 2026 through the Utah Public Procurement Place - Bonfire Portal (U3P-Bonfire). Late Bids, Bids submitted to any other location, or any other form of bid will NOT be considered for award.

B. A bid abstract containing bid results will be provided to bidders by Mapleton City within one week of the bid.

C. For more information related to bid submittals, bonding and other requirements, and contract award, refer to Instructions to Bidders (Document 00 21 13).

1.5 BIDDERS' PRE-QUALIFICATION

A. Bidders are not required to be pre-qualified for the Work.

B. The apparent low bidder will need to demonstrate extensive experience field-designing and constructing bicycle-specific trails and park elements, including downhill trails, jump lines, skill-building loops, and asphalt pump tracks. See Section 32 38 10 Bike Park Contractor Qualifications for requirements and required submittals.

C. If the apparent low bidder does not meet the minimum qualifications, or the references provided are poor, the OWNER reserves the right to award to the next lowest qualified bidder.

1.6 CONTRACT TIME

A. Work must be Substantially Completed by September 18th, 2026.

1.7 BASIS OF BIDS

A. Bids shall be on a unit price basis.

1.8 GOVERNING LAWS AND REGULATIONS

A. This project is not federally funded and does not require the payment of specific wage rates. Payroll submittal will not be required.

B. Bidders on this Work will be subject to the applicable provisions of all federal rules, laws and regulations or orders.

C. Bidder must provide proof that he 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-11-103.

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

MAPLETON
UTAH

00 21 13
INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.1 DEFINED TERMS

A. General Conditions: as published in Document 00 72 00 in the APWA MANUAL OF STANDARD SPECIFICATIONS.

B. Terms used in the Bid Documents that are defined in Article 1.1 of Document 00 72 00 General Conditions will have the meanings indicated in the General Conditions.

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 Mapleton City Public Works Design Standards and Public Works Standard Plans that are applicable to the Work are hereby made part of the Contract Documents by reference. These publications are available on the Mapleton City website.

E. All provisions of the 2026 APWA Utah Chapter Manual of Standard Specifications and Manual of Standard Plans, with Supplements and Addenda if any, which are applicable to the Work are made a part of the Contract Documents by reference. The publications are available at UTAH.APWA.ORG.

F. All provisions of the current edition of the Utah Department of Transportation Standard Specifications and Standard Drawings for Road and Bridge Construction as well as all other specified changes that are applicable to the Work are hereby made part of the Contract Documents by reference. The documents may be obtained separately from UDOT's website, WWW.UDOT.UTAH.GOV.

1.3 PRE-BID CONFERENCE

A. A pre-bid conference will be held at Mapleton City Offices (125 West 400 North) on Tuesday, February 24th, 2026 at 2:00 pm. Attendance will be taken. Attendance is recommended but not mandatory.

1.4 PRE-BID COMMUNICATION

A. All questions and communications shall be directed to OWNER through the Utah Public Procurement Place – Bonfire Portal (U3P-Bonfire) no later that March 5, 2026 at 3:00 PM. To set up an account with U3P-Bonfire, visit: https://utah.bonfirehub.com/portal/?tab=openOpportunities

B. 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 ENGINEER to all prospective bidders.

1.5 PHYSICAL CONDITIONS

A. IN GENERAL: Before submitting a Bid, each Bidder will be responsible for review of 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. SITE, ACCESS TO: The lands upon which the Work is to be performed, rights-of-way and easements for access thereto and other lands designated for use by Bidder in performing the Work are identified in the Contract Documents. 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. 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 4.3.A.2 of the General Conditions.

D. 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 of any kind whatsoever, including reasonable attorneys' fees, that may arise relating to 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: Unit price work shall be governed by Paragraph 11.7 of the General Conditions (Document 00 72 00).

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. 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.

C. BIDDER'S OBLIGATIONS: In addition to Bidder's other responsibilities and obligations regarding submitting a Bid, it is the responsibility of the Bidder before submitting a Bid, to:

1. Examine the Contract Documents thoroughly.
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.
5. Study and carefully correlate Bidder's observations with the Contract Documents.
6. Review all available explorations and data concerning surface and subsurface conditions; and
7. Identify and notify ENGINEER in writing of all specific conflicts, omissions, errors, or discrepancies in the Contract Documents, or if Bidder doubts their meanings.

D. 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. Submission of a Bid shall constitute 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.

2. 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 Contract Documents.

3. The sum of the Performance Bond and the Payment Bond shall be increased or decreased during the Work if 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.

4. 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.

B. By submitting a Bid, Bidder represents that the matters stated herein are true and correct.

C. 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.

PART 2 BIDDING PROCEDURES

2.1 INTERPRETATIONS AND ADDENDA

A. All questions and requests for interpretation of the Contract Documents shall be submitted to the OWNER through the Utah Public Procurement Place - Bonfire Portal (U3P-Bonfire) no later than seven (7) calendar days prior to opening of Bids. At the OWNER's discretion, OWNER will respond on U3P-Bonfire in the form of an Addendum. If OWNER does not respond to a Bidder's request for interpretation, Bidder shall comply with the intent and terms of the Contract Documents.

B. No oral interpretations shall be made to any Bidder. OWNER shall not be responsible for or bound by any statements, interpretations, explanations, representations, conclusions, or assumptions made by any party, whether written or oral, except for written statements that are issued in an Addendum by the OWNER 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 section, paragraph or text and states it is to be so modified. Only the specific section, paragraph or text shall be so modified, and all other portions of the Bid Documents shall remain in effect.

D. Bidders shall acknowledge receipt of all Addenda in the space provided on the Bid Form.

E. Except to postpone a 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 use items of equipment and materials other than those identified in the Contract Documents, said Bidder or Supplier shall submit a written request for approval to the OWNER 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 (Document 00 72 00). 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. OWNER'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 OWNER and will be in the form of an Addendum issued to all Bidder's holding Bid Documents indicating that the additional equipment and materials are approved as equal to those specified for the Project.

E. The Construction Contract, if awarded, shall be based on materials and equipment specified in the Drawings and Specifications and any changes permitted in Addenda.

2.3 BID SECURITIES

A. AMOUNT OF BID SECURITY: A Bid Security must accompany each Bid, made payable to the OWNER. The Bond amount must equal at least five (5) percent of the total amount of the 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.

B. FORM OF BID SECURITY: The Bid Security must be either in the form of a Bid Bond, cashier's check, or certified check. No other form will be accepted. The Bond shall guarantee that the Bidder, if awarded the Work, will promptly enter into the Construction Contract to perform the Work in the manner required by the Contract Documents.

C. BID BOND: The 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.

D. CASHIER'S CHECK OR CERTIFIED CHECK: If a cashier's check or certified check is used in lieu of a Bid Bond, the check must be drawn on a bank doing business in the State of Utah and made payable to OWNER.

E. BID BOND FORM: The Bid Bond form (Document 00 42 00) must be submitted with the Bid Security.

F. PURPOSE OF SUBMISSION: By submitting a Bid Bond Bidder assures OWNER it will take all steps necessary to properly execute the Contract Documents.

G. RETURN OF BID SECURITY: OWNER will return Bid Securities to Bidder within seven (7) days after award of the Construction Contract. Bid Securities of all Bidders will be held until the Construction Contract is awarded or all bids have been rejected. The liability of the OWNER in connection with the Bid Securities shall be limited only to the return of the Bid Securities.

H. DEFAULT: In the event of failure or refusal of the Bidder to enter into the Construction Contract and deliver 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 OWNER, the Bidder shall forfeit the sum of the Bid Security to the OWNER as liquidated damages.

2.4 COMPLETING BID DOCUMENTS

A. The Bidder shall make no stipulations or alterations on the Bid forms. The Bidder must use and execute only the Bid forms and Bid Schedule included in the Contract Documents. The Bidder shall complete and submit all forms listed in Section 2.6 Submission of Bids.

B. The Bidder must fill in all items in the Bid Documents with ink or electronically. Furnish both the unit costs 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 in ink any corrections, interlineations, alterations, or erasures made by the Bidder on Bidder's entries in the Bid Documents.

C. 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.

D. 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.

E. 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.

F. 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.

G. All names must be typed or printed under or near the signature. Signatures shall be in longhand.

H. The Bid shall contain an acknowledgment of receipt of all Addenda. The Addenda numbers must be filled in on the Bid form.

I. The Bidder's address, telephone number, and email for communications regarding the Bid must be shown on the first page of the Bid form.

J. 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.

K. The base Bid and any alternates shall include all Work required to be performed by the Contract Documents.

2.5 CONFLICT OF INTEREST, SUBCONTRACTORS

A. Bidder shall not subcontract more than 50 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 (Document 00 11 16) It is the sole responsibility of the Bidder to deliver the Bid before the scheduled time. Bids will not be accepted after the time specified in the Invitation to Bid.

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 Bid Documents with required signatures and notarized when designated:

1. BID FORM (DOCUMENT 00 41 00)
2. BID BOND (DOCUMENT 00 42 00)
3. BID SCHEDULE (DOCUMENT 00 43 00)
4. STATUS VERIFICATION SYSTEM AFFIDAVIT (DOCUMENT 00 45 37)
5. NON-COLLUSION AFFIDAVIT OF PRIME BIDDER (DOCUMENT 00 45 38)
6. BIKE PARK CONTRACTOR QUALIFICATIONS STATEMENT

D. Failure to include any of these documents will result in Bid being considered non-responsive and may be disqualified.

E. Alternate bids, other than those called for in the Bid form, will not be considered. 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 opening of Bids, Bids may be modified or withdrawn if a written notice of modification or withdrawal is signed by Bidder and delivered to the place where Bids are to be submitted.

B. Within 24 hours after Bids are opened, 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 BIDS SUBJECT TO ACCEPTANCE FOR 45 DAYS

A. All bids remain subject to acceptance for 45 days after the day of the Bid opening. OWNER may, in its sole discretion, release any Bid and return the Bid security prior to expiration of that time period.

2.9 OPENING OF BIDS

A. Bids will be opened and read aloud publicly unless obviously non-responsive. An abstract of the amounts of the base schedule of prices and any alternate schedules will be made available for review after the opening of Bids.

B. Any Bids received after the time specified in the Invitation to Bid will be returned unopened.

PART 3 EVALUATION AND AWARD

3.1 SUBMITTALS REQUIRED FOR EVALUATION

A. After Bid opening, the Bidder, whose Bid is under consideration, must submit the following at the times specified:

1. BIDDER STATUS FORM (DOCUMENT 00 43 38): The Bidder shall submit this report form within 48 hours of OWNER's request.

2. PROPOSED SUBCONTRACTOR FORM (DOCUMENT 00 43 36): The Bidder shall submit this report form within 48 hours of OWNER's request.

3.2 EVALUATION OF BIDDER'S QUALIFICATIONS

A. OWNER, at OWNER's sole discretion, may request any of the following additional documentation from Bidder under consideration, Bidder's Subcontractors, or Bidder's Suppliers. Within seven (7) calendar days following a request by OWNER, the Bidder shall submit promptly to the OWNER the requested information:

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 like 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.
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 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 will evaluate bids based on the total price for the Work. Subject to available funding, the City may award the Work in whole or in part, or may elect to defer portions of the Work at this time. Refer to Summary of Work (Document 01 11 00S) for additional information.

B. 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 interest of the OWNER.

C. 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.

D. If the OWNER intends to make an award to a Bidder, a Notice of Intent to Award will be issued.

E. 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 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.

F. 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).

G. 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.

H. 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.

I. 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 (Document 00 52 00) 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 affected by signing a Change Order concurrent with signing the Agreement.

3.5 SUBSTITUTIONS

A. The Construction Contract, if awarded, will be based on materials and equipment described in the Drawings, Specifications, and any Addenda.

B. After the Effective Date of the Construction Contract, the procedure for applying for substitution is set forth in Article 6.4 of the General Conditions (Document 00 72 00).

3.6 SUBMITTALS REQUIRED FOR AWARD OF CONTRACT

A. In order to execute the contract, the following documents shall be submitted to OWNER within seven (7) calendar days of the receipt of the NOTICE OF INTENT TO AWARD.

B. PERFORMANCE BOND: The OWNER's requirements as to performance bonds are as set forth in the Modifications to General Conditions (Document 00 73 03). 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.

C. PAYMENT BOND: The OWNER's requirements as to payment bonds are as set forth in the Modifications to General Conditions (Document 00 73 03). 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.

D. CERTIFICATE OF INSURANCE: The OWNER's requirements as to insurance are as set forth in the Modifications to General Conditions (Document 00 73 03).

E. 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 03). Specific requirements are set forth in the Status Verification System Affidavit (Document 00 45 37).

F. 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 seven (7) 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 Agreement, bonds, insurance, and Status Verification System Affidavit.

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, Mapleton 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 seven (7) 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

00 39 12
NOTICE OF INTENT TO AWARD

PART 1 GENERAL

1.1 OWNER'S SUBSCRIPTION

A. The OWNER has considered the BID submitted by you for the above-described WORK in response to its Advertisement for Bids called: MAPLETON BIKE PARK PROJECT 2026. You are hereby notified that your BID has been accepted for items in the amount of:
$_____

B. In order to execute the contract, all documents as specified in Section 3.6 of the Instructions to Bidder (Document 00 21 13) must 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 __ of _____, 2026.
MAPLETON CITY CORPORATION
Owner

_____
Logan Miner
Park and Recreation Director

1.2 ACCEPTANCE OF NOTICE OF INTENT TO AWARD

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

_____
(Name of Person Signing)

_____
(Title of Person Signing)

_____
(Signature)

END OF DOCUMENT

00 39 13
NOTICE TO PROCEED

PART 1 GENERAL

1.1 OWNER'S SUBSCRIPTION

A. You are hereby notified to commence work in accordance with the Agreement (Document 00 52 00) for the Project: Mapleton Bike Park Project 2026. The date for substantial completion shall be as stipulated in Section 2.2 of the Agreement.

Dated this __ of _____, 2026.
MAPLETON CITY CORPORATION
Owner

_____
Logan Miner
Parks and Recreation Director

1.2 ACCEPTANCE OF NOTICE

_____
(Name of Person Signing)

_____
(Title of Person Signing)

_____
(Signature)

END OF 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 MAPLETON BIKE PARK PROJECT 2026.

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 ensure 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 seven (7) days after the Notice of Intention to Award, and to begin work within seven (7) 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 a Change Order prior to or concurrent with the execution of the Agreement, if the Change Order 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.

MAPLETON
UTAH

PART 2 EXECUTION

2.1 BIDDER

The Bidder is as follows:

A. Name:_____

B. Address: _____

_____

_____

C. Telephone number: _____

D. Email Address: _____

E. Tax identification number: _____

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 _____, _____.

The undersigned hereby acknowledges receipt of the following Addenda.

(list Addenda numbers here)

2.2 BIDDER'S SUBSCRIPTION

_____

(Name of Person Signing)

_____

(Title of Person Signing)

_____

(Signature)

END OF DOCUMENT

00 42 00
BID BOND

PART 1 GENERAL

1.1 PROCEDURE

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

END OF DOCUMENT

00 43 00
BID SCHEDULE

PART 1 GENERAL

1.1 DOCUMENT INCLUDES

A. Price schedules.

1.2 CONSTRUCTION CONTRACT

A. The Construction Contract is known as MAPLETON BIKE PARK PROJECT 2026.

1.3 REFERENCES

A. APWA 01 29 00: Payment Procedures.

B. Document 00 52 00: Agreement.

C. Document 01 22 00: Measurement and Payment.

1.4 SCHEDULES TO BE ADDED TO THE AGREEMENT

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

MAPLETON
UTAH

PART 2 PRICE SCHEDULES

2.1 SCHEDULE A

No.	Item	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS		
2	Traffic Control	1	LS		
3	SWPPP Compliance & Erosion Control	1	LS		
4	Dust Control & Watering	1	LS		
5	Owner-Directed Subsurface Investigation & Utility Coordination	10	HR		
6	Clearing, Grubbing, & Demolition	1	LS		
7	Construction Layout Staking	1	LS		
8	Materials Testing & Sampling	1	LS		
9	On-site Earthwork and Grading (Plan Quantity)	4,500	CY		
10	Import Common Fill (Owner-Directed)	600	CY		
11	Import Structural Fill (Owner-Directed)	100	CY		
12	Detention Basin Path UBC (6" Thick)	49	CY		
13	Riprap Outlet	600	SF		
14	Curb & Gutter w/ Base	1,960	LF		
15	Pedestrian Curb Cut Assembly w/ Base	1,500	SF		
16	4' Concrete Waterway w/ Base	220	LF		
17	Concrete Sidewalk w/ Base - 4" Thick	19,600	SF		
18	Thickened Edge Concrete Sidewalk w/ Base	2,850	SF		
19	Colored Concrete Flatwork w/ Base	1,800	SF		
20	Sandblasted and Stained City Logo	1	LS		

21	Concrete Stairs w/ Base	14	EA		
22	Stair Handrail	80	LF		
23	Parking Lot Hot Mix Bituminous Paving - 3" Thick	33,800	SF		
24	Parking Lot Untreated Base Course - 6" Thick	625	CY		
25	Asphalt Trail w/ Base	11,100	SF		
26	Pavement Marking Paint	19	GAL		
27	Pavement Message	15	EA		
28	Sign Assembly	8	EA		
29	Concrete Wheel Stop	4	EA		
30	Parking Lot Rockery Wall (2' Height)	145	LF		
31	4" HDPE Field Drain Pipe, Type S	640	LF		
32	4" HDPE Perforated Field Drain Pipe, Type SP	145	LF		
33	15" RCP	215	LF		
34	15" RCP End Section	1	EA		
35	4" Field Drain Inlet	17	EA		
36	8" Field Drain Basin	1	EA		
37	Catch Basin (Single Grate)	4	EA		
38	Drainage Swale	1,100	LF		
39	Steel Tube Culvert	3	EA		
40	6" Sewer Lateral	50	LF		
41	6" PVC Sewer Cleanout	1	EA		
42	1-1/2" Water Service Lateral	520	LF		
43	1-1/2" Water Valve	6	EA		
44	Frost-Free Hydrant (Woodford Model S3)	1	EA		

45	4" Irrigation Lateral	25	LF		
46	Backflow Preventer Assembly	1	EA		
47	Install Owner-furnished Drinking Fountain w/ Sump	3	EA		
48	Service Entrance Equipment	1	EA		
49	Electrical Distribution Panels	4	EA		
50	Trenching and Backfill	1,500	LF		
51	Conduit & Conductor	2,000	LF		
52	Bike Track Lighting Fixtures	16	EA		
53	Path Lighting Fixtures	34	EA		
54	Parking Lot Lighting Fixtures	11	EA		
55	Power Pedestals	5	EA		
56	Misc. Lighting Fixtures	1	LS		
57	Install Owner-Furnished Restroom Building with Pavilion	1	LS		
58	Park Gateway Entrance	1	LS		
59	Concrete Pavers on Concrete Base and Edge	431	SF		
60	Stabilized Stone Dust Surface Trail	1,460	SF		
61	3-Rail Split Fence	810	LF		
62	Stone Veneer Columns	2	EA		
63	Landscape Decorative Boulders	21	EA		

64	Landscape Boulder Retaining Wall	100	SF		
65	6" Mow Curb	2,218	LF		
66	Metal Edging	245	LF		
67	Stacked Stone Steps	10	EA		
68	2" Deciduous Trees	151	EA		
69	6'-8' Evergreen Tree	11	EA		
70	5 Gal Plants	453	EA		
71	1 Gal Plants	944	EA		
72	Flats	3,048	EA		
73	Stone Mulch 3" Deep with Weed Fabric	25,084	SF		
74	Turf Sod	35,650	SF		
75	Native Seed	41,610	SF		
76	Fine Grading and Soil Prep	102,344	SF		
77	Planting Soil Mix - Shrub Areas (12" Depth)	930	CY		
78	Planting Soil Mix - Turf Areas (4" Depth)	440	CY		
79	Planting Soil Mix - Native Seed	510	CY		
80	Topsoil 2" Depth	650	CY		
81	Irrigation System	1	LS		
82	Irrigation Controller	1	LS		
83	Irrigation Point of Connection (POC)	1	LS		
84	Beginner Skills Loop	3,500	LF		
85	Beginner Pre-Fab Skills Feature Allowance	10	EA		
86	Beginner Field Built Feature Allowance	10	EA		

87	Beginner Downhill Bike Trail	3,900	LF		
88	Beginner Built Feature Allowance	10	EA		
89	Intermediate Downhill Bike Trail	4,200	LF		
90	Intermediate Built Feature Allowance	5	EA		
91	Advanced Downhill Bike Trail	2,500	LF		
92	Advanced Built Feature Allowance	5	EA		
93	Climbing Trail / Multi-Use Trail	5,300	LF		
94	Dirt Jump Lines	1,500	LF		
95	Pre-built Takeoff for Jump Lines	15	EA		
96	Imported Material (if needed)	100	CY		
97	Beginner Asphalt Pump Track	3,000	SF		
98	Beginner-Intermediate Asphalt Pump Track	8,800	SF		
99	Flush Curb @ Hub	80	LF		
100	Decomposed Granite Paving @ Hub	500	SF		
101	Boulders @ Hub	12	EA		
102	Wood Drop-Ins @ Hub	2	EA		
103	Pipe Culvert Trail Crossing (Owner-directed)	10	EA		
104	At-grade Trail Crossing Rock Armoring (Owner-directed)	1,000	SF		
105	Bike Park Signage	1	LS		

TOTAL

END OF DOCUMENT

00 43 36
PROPOSED SUBCONTRACTOR FORM

PART 1 GENERAL

1.1 BIDDER

The Bidder is as follows:

A. Name: _____

B. Street Address: _____

C. City, State, Zip: _____

D. Phone number: _____

E. Email address: _____

F. Tax identification number: _____

1.2 CONSTRUCTION CONTRACT

A. The Construction Contract is known as MAPLETON BIKE PARK PROJECT 2026.

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 two (2) percent of the Bid sum are set forth as follows.

MAPLETON
UTAH

SUBCONTRACTORS		
NAME AND ADDRESS	NATURE AND EXTENT OF WORK TO BE SUBLET	AMOUNT
SUPPLIERS		
NAME AND ADDRESS	NATURE AND EXTENT OF MATERIALS TO BE SUPPLIED	AMOUNT

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

_____
(Name of Person Signing)

_____
(Title of Person Signing)

_____
(Signature)

END OF DOCUMENT

MAPLETON
UTAH

00 43 38
BIDDER STATUS FORM

PART 1 GENERAL

1.1 BIDDER

The Bidder is as follows:

A. Name: _____

B. Street Address: _____

C. City, State, Zip: _____

D. Phone number: _____

E. Email address: _____

F. Tax identification number: _____

1.2 CONSTRUCTION CONTRACT

A. The Construction Contract is known as MAPLETON BIKE PARK PROJECT 2026.

PART 2 REPORT

2.1 BIDDER STATUS REPORT

Bidder affirms the following information is true and correct.

1. Number of employees: _____
2. Bidder's firm is: (check the following as applicable)
   a. ☐ Independently owned and operated.
   b. ☐ An affiliate of*
   c. ☐ A subsidiary of*
   d. ☐ A division of*
   e. ☐ A business with gross revenue in excess of $_____
   f. ☐ A business with gross revenue below $_____

   ** PARENT COMPANY:*

   1) Company Name: _____

2) *Street Address:* _____

3) *City, State, Zip:* _____

4) *Phone number:* _____

5) *Email Address:* _____

6) *Responsible Party:* _____

PART 3 EXECUTION

3.1 EFFECTIVE DATE

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

3.2 BIDDER'S SUBSCRIPTION

_____
(Name of Person Signing)

_____
(Title of Person Signing)

_____
(Signature)

END OF DOCUMENT

MAPLETON
UTAH

00 45 37
STATUS VERIFICATION SYSTEM AFFIDAVIT

PART 1 GENERAL

1.1 CONTRACTOR

A. Name: _____

B. Street Address: _____

C. City, State, Zip: _____

D. Phone number: _____

E. Email address: _____

F. Tax identification number: _____

1.2 OWNER

A. The name of the OWNER is MAPLETON CITY CORPORATION

1.3 CONSTRUCTION CONTRACT

B. The Construction Contract is known as MAPLETON BIKE PARK PROJECT 2026.

PART 2 REQUIREMENTS

2.1 REGISTRATION AND PARTICIPATION

A. Bidder has completed a status verification system registration process and follows the requirements of Utah Code Section 63G-11-103.

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 Status Verification System Affidavit (Document 00 45 37).

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.

PART 3 EXECUTION

3.1 CONTRACTOR'S SUBSCRIPTION

CONTRACTOR's Status Verification System ID Number: _____

CONTRACTOR's Utah License Number: _____

_____
(Name of Person Signing)

_____
(Title of Person Signing)

_____
(Signature)

END OF DOCUMENT

MAPLETON
UTAH

00 45 38
NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

PART 1 GENERAL

The undersigned bidder or agent, being duly sworn on oath, says that he/she has not, nor has any other member, representative, or agent of the firm, company, corporation, or partnership represented by him, entered into any combination, collusion, or agreement with any person relative to the price to be bid by anyone at such letting nor to prevent any person from bidding nor to include anyone to refrain from bidding, and that this bid is made without reference to any other bid and without any agreement, understanding, or combination with any other person in reference to such bidding.
He/She further says that no person or persons, firms, or corporation has/have or will receive directly or indirectly, any rebate, fee gift, commission, or thing of value on account of such sale.

PART 2 OATH AND AFFIRMATION

I HEREBY AFFIRM UNDER THE PENALTIES FOR PERJURY THAT THE FACTS AND INFORMATION CONTAINED IN THE FOREGOING BID FOR PUBLIC WORKS ARE TRUE AND CORRECT.

Dated this ____ day of _____, ____

_____
(Name of Organization)

_____
(Title of Person Signing)

_____
(Signature)

PART 3 ACKNOWLEDGEMENT

STATE OF _____)
) ss
COUNTY OF_____)

Before me, a Notary Public, personally appeared the above named and swore that the statements contained in the foregoing document are true and correct.
Subscribed and sworn to me this _____ day of _____, _____.

_____
Notary Public Signature

My Commission Expires: _____

Notary Seal

END OF DOCUMENT

MAPLETON
UTAH

00 52 00
AGREEMENT

PART 1 GENERAL

1.1 CONTRACTOR

A. Name: _____

B. Street Address: _____

C. City, State, Zip: _____

D. Point of Contact Name: _____

E. Telephone number: _____

F. Email Address: _____

1.2 OWNER

The name of the OWNER is Mapleton City Corporation.

1.3 CONSTRUCTION CONTRACT

The Construction Contract is known as MAPLETON BIKE PARK PROJECT 2026.

1.4 ENGINEER

TAYLOR TORGERSEN, 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. Based upon the above awarded schedules, the Contract Price awarded is:

_____DOLLARS

and_____ CENTS. ($ _____).

2.2 CONTRACT TIME

A. Substantial Completion of the Work shall occur by September 18, 2026.

B. Notice to Proceed is anticipated on April 15, 2026, however the OWNER reserves the right to modify the schedule as necessary.

2.3 PUNCH LIST TIME

A. The Work will be complete and ready for final payment within 30 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: Liquidated damages will be assessed at the rate of $1000 per calendar day. The exact dollar amount of liquidated damages for late contract time completion will be referenced based on the original contract amount and will be charged 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 email, 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.

B. SURVEY MONUMENTS: No land survey monument shall be disturbed or moved until CONTRACTOR has applied for and received a permit from Utah County Survey. If a land survey monument is disturbed or moved without a permit, The CONTRACTOR shall be responsible to cover the cost of associated fines, fees, or damages assessed by Utah County Survey at no cost to the OWNER.

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.

PART 3 EXECUTION

3.1 CONTRACTOR'S SUBSCRIPTION

CONTRACTOR's Utah license number: _____

_____
(Name of Person Signing)

_____
(Title of Person Signing)

_____
(Signature)

3.2 OWNER'S SUBSCRIPTION AND ATTESTATION

OWNER: MAPLETON CITY CORPORATION

_____
Therin Garrett (Mayor)

Attest

_____
Camille Brown (City Recorder)

Recommended for approval:

_____
Rob Hunter, P.E. (City Engineer)

3.3 EFFECTIVE DATE

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

END OF DOCUMENT

MAPLETON
UTAH

00 61 13
PERFORMANCE BOND

PART 1 GENERAL

1.1 BOND INORMATION

A. Number: _____

B. Amount: _____DOLLARS ($_____)

1.2 SURETY INFORMATION

A. Name: _____

B. Address: _____

_____

C. Telephone number: _____

D. Email: _____

1.3 CONTRACTOR INFORMATION

A. Name:_____

B. Address: _____

C. _____

D. _____

E. Telephone number: _____

F. Email: _____

1.4 OWNER

A. The owner of the project is MAPLETON CITY CORPORATION

1.5 CONSTRUCTION CONTRACT

A. The Construction Contract is known as MAPLETON BIKE PARK PROJECT 2026.

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, or hand delivered to the address shown on this Bond agreement.

B. Notices sent as required by paragraph 2.2.A shall be effective on the date on which such notice was sent.

C. If any notice requires a period of less than seven (7) days for response, the notice shall be sent by hand delivered.

D. 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 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 1.1.B, 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 CONTRACTOR'S SUBSCRIPTION

Type of Organization: _____
(Corporation, Partnership, Individual, etc.)

CONTRACTOR's Utah license number: _____

_____
(Name of Person Signing)

_____
(Title of Person Signing)

_____
(Signature)

END OF DOCUMENT

MAPLETON
UTAH

00 61 14
PAYMENT BOND

PART 1 GENERAL

1.1 BOND

A. Number: _____

B. Amount: _____DOLLARS ($_____)

1.2 SURETY

A. Name:_____

B. Address: _____

C. _____

D. Telephone number: _____

E. Email: _____

1.3 CONTRACTOR

A. Name:_____

B. Address: _____

C. _____

D. Telephone number: _____

E. Email: _____

1.4 OWNER

A. The owner of the project is MAPLETON CITY CORPORATION

1.5 CONSTRUCTION CONTRACT

A. The Construction Contract is known as MAPLETON BIKE PARK PROJECT 2026.

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.

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.

MAPLETON
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

Type of Organization: _____
(Corporation, Partnership, Individual, etc.)

CONTRACTOR's Utah license number: _____

_____
(Name of Person Signing)

_____
(Title of Person Signing)

_____
(Signature)

NOTARY'S ACKNOWLEDGMENT

STATE OF _____)
) ss
COUNTY OF_____)

Before me, a Notary Public, personally appeared the above named and swore that the statements contained in the foregoing document are true and correct.

Subscribed and sworn to me this _____ day of _____, _____.

_____
Notary Public Signature

My Commission Expires: _____

Notary Seal

3.3 SURETY'S SUBSCRIPTION AND ACKNOWLEDGMENT

Surety Name: _____

_____
(Name of Person Signing)

_____
(Title of Person Signing)

_____
(Signature)

NOTARY'S ACKNOWLEDGMENT

STATE OF _____)
) ss
COUNTY OF_____)

Before me, a Notary Public, personally appeared the above named and swore that the statements contained in the foregoing document are true and correct.

Subscribed and sworn to me this _____ day of _____, _____.

_____
Notary Public Signature

My Commission Expires: _____

Notary Seal

END OF DOCUMENT

00 62 16
CERTIFICATE OF INSURANCE

PART 1 GENERAL

1.1 PROCEDURE

G. For filing purposes, add Certificates of Insurance to the Contract Documents following this page.

H. Certificates of Insurance must include all requirements in Section 5.2 of the Modifications to General Conditions (Supplementary Conditions) (Document 00 73 03).

END OF DOCUMENT

MAPLETON
UTAH

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

MAPLETON
UTAH

00 92 45
CHANGE ORDER FORM

CHANGE ORDER NO. _____

PART 1 GENERAL INFORMATION

1.1 CONTRACT DETAILS

A. Project: MAPLETON BIKE PARK PROJECT 2026
B. Date of Issuance: _____
C. Owner: MAPLETON CITY CORPORATION
D. Contractor: _____
E. Owner's Rep: LOGAN MINER – PARKS AND RECREATION DIRECTOR
F. Contractor's Rep: _____

1.2 CHANGE ORDER DETAILS

A. Description: _____
B. Purpose of Change Order: _____
C. Attachments: _____
D. Original Contract Price: $ _____
E. Prior Change Orders No.___ to No.___
F. Contract Price with all Prior Change Orders Included: $ _____
G. Cost of this Change Order: $ _____
H. New Contract Price with all approved Change Orders: $ _____
I. Change to CONTRACT TIME (days): _____
J. Revised Substantial Completion Date: _____

1.3 APPROVALS REQUIRED

RECOMMENDED:	APPROVED:	ACCEPTED:
_____	_____	_____
Engineer	Owner	Contractor

END OF DOCUMENT

SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS

MAPLETON
UTAH

SUNRISE
ENGINEERING

MAPLETON
UTAH

00 73 03
MODIFICATIONS TO GENERAL CONDITIONS
(SUPPLEMENTARY CONDITIONS)

PART 1 PURPOSE

A. 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.

PART 2 MODIFICATIONS

2.2 COPIES OF DOCUMENTS

DELETE PARAGRAPH 2.2.A IN ITS ENTIRETY AND INSERT THE FOLLOWING IN ITS PLACE:

A. 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.

B. OWNER shall *not* furnish to CONTRACTOR reference Contract Documents which include the Utah APWA Manual of Standard Plans and the Manual of Standard Specifications. Such documents shall be purchased separately by the CONTRACTOR.

2.5 BEFORE STARTING CONSTRUCTION

DELETE PARAGRAPH 2.5.C IN ITS ENTIRETY AND INSERT THE FOLLOWING IN ITS PLACE:

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.

5.1 PERFORMANCE, PAYMENT AND OTHER BONDS

MODIFY ARTICLE 5.1 TO READ AS FOLLOWS

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.

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.

5.2 INSURANCE

MODIFY ARTICLE 5.2 TO READ AS FOLLOWS

A. Contractor shall provide the following minimum insurance coverage from companies holding a General Rating of "A" or better as set forth in the most current issue of Best's Key Rating Insurance Guide written for not less than the following, or greater if required by law and all such insurance to be primary to any insurance maintained by Owner, shall name Owner as additional insured with waiver of subrogation:

1. The Contractor's Worker's Compensation Insurance shall be written for not less than the statutory limits for the locale of the Project and the Contractor's Employer's Liability Insurance shall be written for not less than $2,000,000.

2. The Contractor's Comprehensive Automobile Liability Insurance shall be written with combined single limits of not less than $2,000,000 each occurrence.

3. The Contractor's Comprehensive General Liability Insurance shall be written with contractual liability coverage with a general aggregate not less than $4,000,000 and each occurrence not less than $2,000,000.

4. 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.

5. If Contractor uses any subcontractors, Contractor will provide for subcontractors or require the same insurance provisions for its subcontractors.

6.5 SUBCONTRACTORS, SUPPLIERS AND OTHERS

DELETE PARAGRAPH 6.5.H IN ITS ENTIRETY

6.8 LAWS AND REGULATIONS

ADD THE FOLLOWING NEW PARAGRAPH IMMEDIATELY AFTER PARAGRAPH 6.8.B:

C. All Bidders are required to follow the requirements of Utah Code Annotated 63G-11-103 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 in response to this RFB, CONTRACTOR certifies that it 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-11-103, 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.

14.2 APPLICATION FOR PROGRESS PAYMENTS

DELETE PARAGRAPH 14.2.E IN ITS ENTIRETY AND INSERT THE FOLLOWING IN ITS PLACE:

E. RETAINAGE: The amount of retainage with respect to progress payments shall be 5% of total work completed to date.

END OF DOCUMENT

MAPLETON
UTAH

01 11 00S
SUMMARY OF WORK

MODIFY SECTION 01 11 00 TO READ AS FOLLOWS

PART 1 GENERAL

1.1 GENERAL

A. The WORK to be performed under this Contract shall consist of furnishing all labor, materials, equipment, tools, transportation, services, incidentals, etc. 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, but which are necessary for the complete and proper construction of the WORK in good faith, shall be provided by CONTRACTOR at no additional cost to OWNER.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The WORK to be performed primarily includes, but is not limited to, construction of the Mapleton Bike Park on city-owned land near Harmony Ridge Parkway in Mapleton City. The project includes site preparation, grading, drainage improvements, water & sewer services, electrical improvements, asphalt parking areas, concrete curb & gutter, concrete flatwork, paved trails, a restroom building, landscaping, irrigation systems, asphalt pump tracks, mountain bike trails, and multi-use trails, complete and operational.

1.3 WORK BY OTHERS

A. CONTRACTOR shall cooperate fully with all utility forces of 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. The maintenance/storage shed structure called out in the plans will be supplied and installed by others. See Site Plan for additional details. See appendices for layout of shed.

1. Footings for shed will be installed by others.

2. CONTRACTOR is responsible for all related site improvements necessary to install maintenance shed including preparation of subgrade, construction of concrete pad, etc. CONTRACTOR required to coordinate with OWNER & shed installer and sequence construction to allow for installation of footings and structure.

C. The pump track pavilions and shade sails called out in the plans will be supplied and installed by others. See Site Plan for additional details.

1. Footings for pavilions and shade sails will be installed by others.

2. CONTRACTOR is responsible for all related site improvements necessary to install pump track pavilions and shade sails including preparation of subgrade, construction of concrete pad, etc. CONTRACTOR required to coordinate with OWNER & pavilion/shade sail installer and sequence construction to allow for installation of footings and structures.

D. The playground equipment and poured-in-place surfacing (PIP) called out in the plans will be supplied and installed by others. This includes the PIP within the pump track areas. See Site, Landscape, and Bike Plans for additional details.

1. Footings for playground equipment will be installed by others.

2. CONTRACTOR is responsible for all related site improvements necessary to install playground equipment and PIP including preparation of subgrade, construction of concrete walkways adjacent to playground area, etc. CONTRACTOR required to coordinate with OWNER & installer and sequence construction to allow for installation of footings and structures.

E. The site furnishings called out in the plans will be supplied and installed by others. See Site, Landscape, and Bike Plans for additional details.

1. Site furnishings include picnic tables, benches, trash cans, bike racks, and bike repair stations

2. CONTRACTOR is responsible for constructing surface mount footings for site furnishings (see Landscape Plans for additional details). CONTRACTOR to coordinate with owner to ensure proper placement of footings.

3. CONTRACTOR is responsible for all related site improvements necessary to site furnishings including preparation of subgrade, construction of surrounding concrete flatwork, etc.

F. The flagpoles called out in the plans will be supplied and installed by others. See Site and Landscape Plans for additional details.

1. CONTRACTOR is responsible to coordinate with OWNER on location to ensure proper placement of electrical for flagpoles.

G. Construction staking required for this work will be performed by CONTRACTOR.

1.4 LIMITATION OF OPERATIONS

A. Work Hours: No work is allowed between the hours of 7:00 PM and 7:00 AM.

1.5 WORK SEQUENCE

A. CONTRACTOR's sequencing and schedule for this project must conform to all provisions of the Contract Documents and applicable traffic control requirements. See Section 01 55 26 for details.

B. OWNER requires that the WORK under this contract be completed as quickly as reasonably possible. CONTRACTOR shall prepare and submit a detailed construction schedule to ENGINEER and OWNER as outlined in Section 00 72 00 2.5.B. Any changes to the construction schedule shall be submitted to ENGINEER and OWNER as outlined in Section 00 72 00 6.3.A.

1.6 CONTRACTOR USE OF PREMISES

A. The CONTRACTOR's use of the project site shall be limited to its construction operations within the construction work zone and as outlined in the drawings. 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 follow the guidelines of the Storm Water Pollution Prevention Plan, if provided with the Contract Documents. If a Storm Water Pollution Prevention Plan is not provided with the Contract Documents, 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.

PART 2 PRODUCT NOT USED

PART 3 EXECUTION NOT USED

END OF DOCUMENT

MAPLETON
UTAH

01 22 00
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes measurement and payment provisions.

1.3 PROCEDURES

A. Units of measurement for each bid item are as given in the Bid Schedule(s).

B. See general Measurement and Payment procedures in Payment Procedures (Utah APWA Document 01 29 00).

C. Any improvements damaged by CONTRACTOR will be replaced at no additional cost to OWNER.

D. CONTRACTOR shall be responsible for the preservation of neighborhood facilities. If damage occurs during construction, CONTRACTOR shall provide restoration of damaged facilities at no additional cost to OWNER.

E. All time, materials, transportation, equipment, expenses, operations, labor, insurance, applicable taxes, overhead, and profit necessary to complete the Work in the manner intended by the Drawings, Contract Documents and Specifications shall be included in the Bid. Bid items not expressly listed in the Bid Schedule shall be considered incidental to the Work, shall be included in the Bid prices for the various line items and work classifications, and shall not cause CONTRACTOR to be eligible for additional payment by OWNER.

PART 2 BASE BID SCHEDULE

This Section seeks to more clearly identify those tasks which are specifically included in each of the respective Bid Schedule items and thereby minimize confusion that sometimes arises with regard to measurement of and payment for specific tasks comprising the Work. Inclusion or exclusion of any item or task from this Section shall in no way be construed to mean that additional payment shall be required of OWNER.

2.1 MOBILIZATION

A. Mobilization and Demobilization shall be measured by percentage of total project complete.

B. Payment will be made on percentage basis as follows.

PERCENT OF ORIGINAL CONTRACT AMOUNT EARNED	PERCENT OF AMOUNT BID TO BE PAID
5	40
15	20
40	30
50	10

C. This item shall be governed by SECTION 01 71 13 of the APWA Standard Specifications, APWA PLAN 412, Mapleton City Standards, and the contract documents provided.

D. Includes cost of mobilization, demobilization, installation of temporary facilities, and bringing necessary construction equipment to site.

E. Includes creation of preconstruction video.

2.2 TRAFFIC CONTROL

A. Measurement will be made by lump sum (LS).

B. Partial payment shall be made based on the overall percentage of the project that is paid for at each payment request.

C. Payment covers traffic control plan, traffic control technician, flaggers, pavement markings, signs, barricades, and all traffic control devices (Refer to Section 01 55 26, Traffic Control). Emergency services notification submission shall be stamped by a Professional Engineer.

D. Payment covers site security measures including any temporary construction fencing.

2.3 SWPPP COMPLIANCE & EROSION CONTROL

A. Measurement will be made by lump sum (LS).

B. Partial payment shall be made based on the overall percentage of the project that is paid for at each payment request.

C. Includes obtaining an official SWPPP document and permit through the State of Utah Division of Water Quality (DWQ) under the latest available Utah Pollutant Discharge Elimination System (UPDES).

D. Includes implementation, and maintenance of SWPPP document including Best Management Practices (BMPs) for erosion control, sediment control, construction access, water quality protection, stream zone protection, filing Notice of Intent (NOI), completion of SWPPP inspection reports, filing a Notice of Termination (NOT) upon completion of Project, applying any required post-construction BMPs, etc.

E. Item includes all erosion control that is not listed as separate bid items, which includes but is not limited to: silt fence, construction fencing, inlet protection, inlet clean-out, and stabilized roadway entrances.

F. CONTRACTOR shall be solely responsible for any fines or penalties resulting from failure to comply with DWQ's requirements or the City's Storm Water Ordinance.

2.4 DUST CONTROL & WATERING

A. This item shall be paid for as a lump sum item.

B. Partial payment shall be made based on the overall percentage of the project that is paid for at each payment request.

C. Includes providing appropriate dust control and water required for compaction.

D. Water meter to be provided by OWNER.

2.5 OWNER-DIRECTED SURFURFACE INVESTIGATION & UTILITY COORDINATION

A. This item shall be paid for as an hourly item.

B. This item is for any additional investigation (potholing) directed by OWNER or ENGINEER.

C. Includes proper backfill of the explored area.

D. This item does not cover any investigation (potholing) to locate piping, valves, connections, crossings, etc. as required to install bid items in the regular course of the Work. Any investigation (potholing) required as part of the regular course of the Work shall be considered incidental to those items of work.

E. This item does not cover any coordination with utilities required to install bid items in the regular course of the Work. Any coordination required as part of the regular course of the Work shall be considered incidental to those items of work.

2.6 CLEARING, GRUBBING & DEMOLITION

A. This item shall be paid for as a lump sum item.

B. Partial payment shall be made based on the overall percentage of the project that is paid for at each payment request.

C. Includes clearing, stripping, over-excavating, and/or grubbing of unsuitable subgrade soils per recommendations in Project's Geotechnical Investigation Report.

1. Includes removing topsoil, manmade fills (where encountered) and soils loosened by construction activities prior to excavation placement of site grade fills.

D. Includes hauling off all unsuitable subgrade soils.

E. Includes hauling off all excavated and/or deleterious material.

F. Includes removal and disposal of existing fences.

G. Includes demolition and proper disposal of existing concrete and asphalt to tie-in improvements as show in Plans.

H. Includes providing all labor, materials, equipment, tools, and incidentals necessary to restore existing surface improvements disturbed by construction activities to equal or better condition than existing, including pavement, concrete, curb and gutter, trails, landscaping, irrigation, and other surface features, as directed by the ENGINEER.

2.7 CONSTRUCTION LAYOUT STAKING

A. This item shall be paid for as a lump sum item.

B. Partial payment shall be made based on the overall percentage of the project that is paid for at each payment request.

C. Includes all materials, equipment, operations, and labor necessary to provide construction staking in accordance with the drawings and project specifications such that the final surface grading required by the drawings may be accomplished.

D. Includes the cost of having this work prepared by or overseen by a Professional Land Surveyor as required by the current state statues and laws.

E. Includes re-staking for removed or damaged stakes.

F. Includes preparation of the construction record drawings (CRDs) showing the as-constructed features

2.8 MATERIAL TESTING & SAMPLING

A. This item shall be paid for as a lump sum item.

B. Includes all efforts performed by CONTRACTOR to get the appropriate sampling and testing from a certified laboratory as described by the Contract Documents and Specifications. This includes but is not limited to:

1. Earthwork compaction testing
2. Concrete testing
3. Asphalt testing
4. Special inspections

2.9 ON-SITE EARTHWORK AND GRADING (PLAN QUANTITY)

A. This item shall be paid for on a cubic yard (CY) basis (plan quantity).

B. The quantity included in the bid shall be the quantity paid, unless an approved change order modifies the limits and scope of the overall project.

C. Earthwork volumes given are calculated and don't account for field conditions including potential of shrinkage and expansion.

D. Includes all excavation, transportation, processing, placement, grading, and proper compaction of existing on-site material to produce an acceptable subgrade for the improvements as indicated in the Contract Documents, Specifications, and Drawings.

E. Includes subgrade preparation required to install improvements such as parking lot pavement, trail pavement, concrete flatwork, curb & gutter, landscape areas, asphalt pump tracks, restroom building, shade structures, retaining walls, etc.

F. Includes unclassified excavation not otherwise included in other bid items.

G. Includes excavation and subgrade preparation required to install storm drain detention basins.

H. This item includes earthwork and grading necessary to prepare the subgrade pad beneath the asphalt pump tracks.

I. This item excludes any earthwork or grading required for the downhill bike trails, bike jump lines, or bike skills loop.

2.10 IMPORT COMMON FILL (OWNER-DIRECTED)

A. This item shall be paid for on a cubic yard basis (plan quantity).

B. This item is intended for use when additional common fill is required to build the site's subgrade to the proposed subgrade elevation. CONTRACTOR shall coordinate with OWNER and geotechnical engineer for use of this item.

C. Includes procurement of common fill material and transportation to the site.

D. Includes on-site hauling, placement, grading, and compaction of the common fill material.

E. Includes proper preparation of subgrade required to install improvements such as parking lot pavement, trail pavement, concrete flatwork, curb & gutter, landscape areas, asphalt pump tracks, restroom building, shade structures, retaining walls, etc.

2.11 IMPORT STRUCTURAL FILL (OWNER-DIRECTED)

A. This item shall be paid for on a cubic yard basis (plan quantity).

B. This item is intended for use when existing site soils are not suitable for use as structural fill and imported structural fill is required (see project geotechnical report). CONTRACTOR shall coordinate with OWNER and geotechnical engineer for use of this item. CONTRACTOR shall not receive separate payment for Untreated Base Course, Structural Fill, or other fill materials under this item where it is included under another bid item.

C. Includes procurement of structural fill material and transportation to the site.

D. Includes on-site hauling, placement, grading, and compaction of the structural fill material.

E. Includes proper preparation of subgrade required to install improvements such as parking lot pavement, trail pavement, concrete flatwork, curb & gutter, landscape areas, asphalt pump tracks, restroom building, shade structures, retaining walls, etc.

F. This item excludes imported fill required for construction of the asphalt pump tracks including the roadway base material called out for in the pump track plans & details. Imported fill for the pump tracks shall be paid for under the asphalt pump track bid items.

G. CONTRACTOR shall not receive separate payment for Untreated Base Course or Structural Fill under this item where it is included under another bid item.

2.12 DETENTION BASIN PATH UBC - 6" THICK

A. This item shall be paid for on a square foot basis.

B. Includes provision, excavation, transport, processing, placement, grading, and proper compaction of material to elevations shown on plan sheets.

C. Includes proper preparation of subgrade prior to placement.

D. This bid item shall be used for the Untreated Base Course necessary to construct the 8’ wide access paths around the detention basins. CONTRACTOR shall not receive separate payment for Untreated Base Course under this item where it is included under another bid item.

2.13 RIPRAP OUTLET

A. This item shall be paid for on a square foot basis.

B. Includes provision, excavation, transport, processing, placement, grading, and proper compaction of material to elevations shown on plan sheets.

C. Includes proper preparation of subgrade prior to placement.

D. Includes filter fabric beneath riprap.

E. This item shall be used for the riprap outlets for the detention basins. Riprap for the riprap swales will be covered under a separate bid item.

2.14 CURB & GUTTER W/ BASE

A. Item shall be paid for on a lineal foot basis measured by back of curb.

B. Includes concrete curb & gutter and untreated base course.

1. Untreated base course thickness to match roadway untreated base course thickness or thickness called out in plans, whichever is greater.

C. Includes expansion joint filler, contraction joints, and curing agent.

D. Includes proper preparation of subgrade soil.

E. Item does not cover curb & gutter included under another bid item such as curb cut, flare, and transition areas covered by the “PEDESTRIAN CURB CUT ASSEMBLY” bid item.

2.15 PEDESTRIAN CURB CUT ASSEMBLY W/ BASE

A. This item shall be paid for on a square foot basis.

B. Includes untreated base course, concrete flatwork, curb wall, and curb and gutter within the limits of the pedestrian curb cut assembly.

1. The pedestrian curb cut assembly shall include the curb transition and curb cut as well as the turning space, curb ramp, blended transition, clear space, flare, and approach areas.

C. Includes procurement and placement of detectable warning surface spanning entire width of curb cut.

D. Includes proper preparation of subgrade soil.

2.16 4' CONCRETE WATERWAY W/ BASE

A. This item shall be paid for on a square foot basis.

B. Includes provision, excavation, transport, processing, placement, grading, and proper compaction of untreated base course material to elevations shown on plan sheets.

C. Includes proper preparation of subgrade.

D. Includes concrete and reinforcement.

E. Includes curing agent.

F. Includes expansion joint filler, contraction joints, and joint sealants.

2.17 CONCRETE SIDEWALK W/ BASE - 4” THICK

A. This item shall be paid for on a square foot basis.

B. Includes untreated base course and concrete flatwork.

C. Includes curing agent.

D. Includes expansion joint filler, contraction joints, and joint sealants.

E. Includes proper preparation of subgrade.

F. Item does not cover concrete sidewalk included under another bid item such as:

1. Concrete sidewalk included under the “PEDESTRIAN CURB CUT ASSEMBLY” bid item.
2. Interior concrete slab for restroom building as per restroom plans.

G. Item includes exterior concrete flatwork for restroom building as per restroom plans.

1. Includes concrete flatwork under the restroom building’s open-sided pavilion area

2.18 THICKENED EDGE CONCRETE SIDEWALK W/ BASE

A. This item shall be paid for on a square foot basis.

B. Includes untreated base course, rebar, and concrete flatwork.

C. Includes curing agent.

D. Includes expansion joint filler, contraction joints, and joint sealants.

E. Includes proper preparation of subgrade.

F. Item does not cover concrete sidewalk or flatwork included under another bid item such as:

1. Concrete flatwork included under the “PEDESTRIAN CURB CUT ASSEMBLY” bid item.
2. Non-thickened-edge concrete sidewalk included under the “CONCRETE SIDEWALK W/ BASE - 4” THICK” bid item.
3. Interior concrete slab for restroom building as per restroom plans.

2.19 COLORED CONCRETE FLATWORK W/ BASE

A. This item shall be paid for on a square foot basis.

B. Includes untreated base course and integrally-colored concrete flatwork.

C. Includes curing agent, colored release powder, and sealer.

D. Includes expansion joint filler, contraction joints, and joint sealants.

E. Includes proper preparation of subgrade.

F. Includes construction of sample panel.

2.20 SANDBLASTED AND STAINED CITY LOGO

A. This item shall be paid for on a lump sum basis.

B. Includes procuring steel stencil for use in sandblasting logo.

C. Includes sandblasting logo.

D. Includes staining logo and sealing.

E. Includes sandblasting and staining of sample panel.

F. This bid item only covers sandblasting and staining the City's logo on the colored concrete surface. Installation of the colored concrete is covered under the "COLORED CONCRETE FLATWORK W/ BASE" bid item.

2.21 CONCRETE STAIRS W/ BASE

A. This item shall be paid for on a per each basis for each installed stair.

B. Includes proper preparation of subgrade.

C. Includes untreated base course and concrete.

D. Includes expansion joint filler, abrasive nosing, rebar, dowels, etc.

E. Stair handrails are not included under this item and are included under the "STAIR HANDRAIL" bid item.

2.22 STAIR HANDRAIL

A. This item shall be paid for on a lineal foot basis.

B. Includes steel pipe along with all metal fabrication, finishing, powder coating, etc.

C. Includes core drilling and grouting into concrete stairs.

D. Includes all labor, overhead, equipment, materials, etc. required to install railing.

2.23 PARKING LOT HOT MIX BITUMINOUS PAVING – 3" THICK

A. This item shall be paid for on a square foot basis.

B. This bid item shall be used for parking lot asphalt. Asphalt surfacing required for “ASPHALT TRAIL w/ BASE” is included under another bid item.

C. Includes aggregates, asphalt binder, hydrated lime, tack coat, and other additives, etc.

D. Includes all equipment, labor, transportation, placement, and compaction.

2.24 PARKING LOT UNTREATED BASE COURSE - 8" THICK

A. This item shall be paid for on a square foot basis.

B. Includes provision, excavation, transport, processing, placement, grading, and proper compaction of material to elevations shown on plan sheets.

C. Includes proper preparation of subgrade prior to placement.

D. This bid item shall be used for Untreated Base Course under parking lot asphalt. CONTRACTOR shall not receive separate payment for Untreated Base Course under this item where it is included under another bid item.

2.25 ASPHALT TRAIL W/ BASE

A. This item shall be paid for on a square foot basis.

B. This bid item shall be used for trail asphalt with untreated base course. Asphalt surfacing and untreated base course for parking lot surfacing is included under other bid items.

C. Includes high-density mineral bond, aggregates, asphalt binder, hydrated lime, tack coat, other additives, etc. as well as all equipment, labor, transportation, placement, and compaction.

D. Includes provision, excavation, transport, processing, placement, grading, and proper compaction of untreated base course material to elevations shown on plan sheets.

E. Includes proper preparation of subgrade.

2.26 PAVEMENT MARKING PAINT

A. This item shall be paid for on a per gallon basis of pavement marking paint furnished and applied.

B. Includes installation of all paint striping in parking lot.

C. Includes installation of stop bars and crosswalks.

D. Pavement messages including arrows, symbols, etc. are paid for under “PAVEMENT MESSAGES” bid item.

2.27 PAVEMENT MESSAGE

A. This item shall be paid for on a per each basis for each individual message as described below.

1. Arrow = one message
2. Parking Accessibility Symbol = one message

2.28 SIGN ASSEMBLY

A. This item shall be paid for on a per each basis for each installed sign assembly.

B. Includes stop sign, trail stop sign, and accessible parking sign assemblies.

C. Sign assemblies include concrete foundation, base, sign post, and any attached sign panels.

2.29 CONCRETE WHEEL STOP

A. This item shall be paid for on a per each basis.

B. Includes all labor, equipment, and materials required to provide and install precast concrete wheel stops, including but not limited to:

1. Placement, alignment, anchoring or pinning.
2. Surface preparation and cleanup.

C. Includes drilling and securing dowels or anchors where required.

2.30 PARKING LOT ROCKERY WALL (2’ HEIGHT)

A. This item shall be paid for on a lineal foot basis.

B. Includes excavation of existing soils and proper preparation of subgrade.

C. Includes procurement and placement of structural fill.

D. Includes stacked rocks, granular rock backdrain, impermeable material at top of backdrain, and non-woven geotextile.

E. Includes backfill of retained area behind wall.

F. Includes installing wall in accordance with the drawings and the recommendations of the Geotechnical Report.

2.31 4” HDPE FIELD DRAIN PIPE, TYPE S

A. This item shall be paid for on a lineal foot basis.

B. Includes trenching, pipe, fittings, bedding, and backfill.

C. Includes grate at outlet end of pipe.

2.32 4” HDPE PERFORATED FIELD DRAIN PIPE, TYPE SP

A. This item shall be paid for on a lineal foot basis.

B. Includes trenching, pipe, fittings, bedding, and backfill.

2.33 15” REINFORCED CONCRETE PIPE (RCP)

A. This item shall be paid for on a lineal foot basis measured along the centerline of pipe.

1. Where pipe connects into structures such as catch basins or manholes, pipe shall be measured to inside edge of structure.

B. Includes installation of the storm drain pipe of the size and type indicated, complete in place. This includes but is not limited to:

1. Pipe, metallic warning tape, and grout.
2. Excavation of pipe trench, installation of pipe, pipe bedding, and trench backfill.
3. Connections to existing or proposed structures or pipes as shown or indicated in plans.
4. Pipe line cleaning.
5. Other miscellaneous items or appurtenances necessary to complete the installation of this item.

2.34 15” RCP END SECTION

A. This item shall be paid for on a per each basis.

B. Includes furnishing and installing a reinforced concrete end section with trash guard.

2.35 4” FIELD DRAIN INLET

A. This item shall be paid for on a per each basis.

B. Includes excavation, provision and placement of structure, frame, grate, untreated base course, connection of drain pipe, etc.

C. Includes grading of surrounding area to drain to inlet.

2.36 8” FIELD DRAIN BASIN

A. This item shall be paid for on a per each basis.

B. Includes field drain basin, frame & grate, tees, gaskets, etc.

C. Includes excavation, bedding, connections to field drain pipe, backfill, compaction, and adjustment to finished grade.

D. Includes all fittings, adapters, and appurtenances necessary to complete the installation.

2.37 CATCH BASIN (SINGLE GRATE)

A. This item shall be paid for on a per each basis.

B. Includes catch basin box, frame, curb & grate inlet, snout, etc.

C. Includes excavation, base preparation, structure installation, grouting & connections to storm drain pipe, backfill, compaction, and adjustment to finished grade.

D. Includes all fittings, appurtenances, and incidentals necessary to complete the installation as shown on the drawings.

2.38 DRAINAGE SWALE

A. This item shall be paid for on a linear foot basis.

B. Includes riprap.

C. Includes excavation, shaping, and grading to construct the drainage swale.

D. Includes proper subgrade preparation.

2.39 STEEL TUBE CULVERT

A. This item shall be paid for on a per each basis.

B. Includes steel tube, rebar, and fabricating necessary to attached rebar to steel tube.

C. Includes concrete and rebar reinforcement.

D. Includes untreated base course and proper preparation of subgrade.

2.40 6” SEWER LATERAL

A. This item shall be paid for on a lineal foot basis.

B. Includes PVC sewer lateral pipe, fittings, and appurtenances.

C. Includes trench excavation, bedding, pipe placement, joints, connections, backfill, compaction, and alignment to required lines and grades.

D. Includes connection to existing PVC sewer lateral stubbed into project area.

E. Includes installation of sewer lateral to within 10’ of restroom building

1. Installation of lateral within 10’ of restroom building shall be covered under the “INSTALL OWNER-FURNISHED RESTROOM” bid item.

2.41 6” PVC SEWER CLEANOUT

A. This item shall be paid for on a per each basis.

B. Includes excavation, pipe, fittings, cleanout riser, cap, bedding, backfill, compaction, and adjustment to finished grade.

2.42 1-1/2” WATER SERVICE LATERAL

A. This item shall be paid for on a linear foot basis.

B. Includes furnishing and installing the water service lateral from the water service point of connection to the service termination points as shown on the drawings.

C. Includes

1. Pipe, polywrap, fittings, and stiffeners
2. Metallic warning tape and tracer wire
3. All miscellaneous connections and tie-ins

D. Includes excavation, trenching, bedding, backfill, compaction, and restoration.

E. Includes pressure testing, flushing, and disinfection.

F. Includes installation of water lateral to within 10’ of restroom building

1. Installation of water lateral within 10’ of restroom building shall be covered under the “INSTALL OWNER-FURNISHED RESTROOM” bid item.

2.43 1-1/2” WATER VALVES

A. This item shall be paid for on a per each basis.

B. Includes valve assembly, valve box, lid, plugs, caps, wires, polywrap, support blocks, concrete collar, adjustments to grade, etc.

C. Includes any miscellaneous connections, tie-ins, piping, fittings, polywrap, tracer wire, thrust protection, fittings, disconnects, etc. necessary to install valve.

D. Includes excavation, bedding, backfill, compaction, and surface restoration required to complete the installation.

E. Includes testing, operation verification, and coordination required to place the valves into service.

F. Item does not include installation of water valve for restroom building. Installation of water valve for restroom building shall be covered under the “INSTALL OWNER-FURNISHED RESTROOM” bid item.

2.44 FROST-FREE HYDRANT (WOODFORD MODEL S3)

A. This item shall be paid for on a per each basis.

B. Includes furnishing and installing a frost-free hydrant (Woodford Model S3 or approved equal) complete in place as shown on the drawings.

C. Includes excavation, setting of hydrant, connection to water service piping, drainage or gravel pocket at base of hydrant, backfill, compaction, and adjustment to finished grade.

D. Includes all fittings, valves, appurtenances, and incidentals necessary to complete the installation.

E. Installation shall conform to applicable APWA Sections 33 10 00 and 33 11 00 and the drawings.

2.45 4” IRRIGATION LATERAL

A. This item shall be paid for on a linear foot basis.

B. Includes installation of irrigation lateral pipe from existing irrigation stub along Harmony Ridge Dr. to proposed point of connection adjacent to restroom building.

C. Includes

1. Pipe, polywrap, fittings, and grout
2. Metallic warning tape and tracer wire
3. All miscellaneous connections and tie-ins

D. Includes excavation, trenching, bedding, backfill, compaction, and restoration.

E. Includes pressure testing, flushing, and disinfection.

2.46 BACKFLOW PREVENTER ASSEMBLY

A. This item shall be paid for on a per each basis.

B. Includes backflow preventer assembly, box, lid, shutoff valves, fittings, supports, etc.

C. Includes connecting to irrigation and water system

D. Includes adjustment to proper elevation and orientation.

E. Includes testing, certification, and coordination required to place the backflow preventer into service in accordance with applicable requirements.

2.47 INSTALL OWNER-FURNISHED DRINKING FOUNTAIN W/SUMP

A. This item shall be paid for on a per each basis.

B. Includes receiving, storage, protection, and handling of owner-furnished drinking fountain.

C. Includes procurement of drinking fountain service lateral pipe, drinking fountain service lateral valve, valve box, drain pipe, crushed stone, sump liner, and filter fabric.

D. Includes procurement of all other fittings, appurtenances, and incidentals necessary to complete the installation.

E. Includes installation of owner-furnished drinking fountain.

F. Includes excavation, sump installation, connections to water and drainage piping, backfill, compaction, and adjustment to finished grade.

G. Concrete flatwork for drinking fountain pad shall be included under the “CONCRETE SIDEWALK W/ BASE – 4” THICK” bid item.

2.48 SERVICE ENTRANCE EQUIPMENT

A. This item shall be paid for on a per each basis.

B. This bid item shall include utility coordination, meterbase, mounting hardware, equipment pad, fittings, terminations, and other items as required by utility.

2.49 ELECTRICAL DISTRIBUTION PANELS

A. This item shall be paid for on a per each basis.

B. This bid item shall include all materials and labor necessary to provide and install the new distribution panels as described in the Mapleton Bike Park one-line diagram. Panels shall be complete with enclosures and all circuit

breakers, mounting hardware, equipment racks, and equipment pads, and all required accessories for a complete installation.

2.50 TRENCHING AND BACKFILL

A. This item shall be paid for on a lineal foot basis.

B. Includes trenching and backfill for all electrical improvements. This includes but is not limited to:

1. Excavation of trench
2. Procurement, placement, and compaction of bedding and select backfill.
3. Installation of conduits in trench.
4. Electrical marking tape.

C. Other miscellaneous items or appurtenances necessary to complete the installation of this item.

2.51 CONDUIT & CONDUCTOR

A. This item shall be paid for on a lineal foot basis.

B. This bid item shall include all conduit, conductor, fittings, installation, site preparation, conduit supports, and any required accessories for complete conduit and conductor system.

2.52 BIKE TRACK LIGHTING FIXTURES

A. This item shall be paid for on a per each basis.

B. Includes light fixtures, poles, pole bases, luminaires, fittings, mounting hardware, terminations, and all required accessories.

2.53 PATH LIGHTING FIXTURES

A. This item shall be paid for on a per each basis.

B. Includes light fixtures, pedestals, pedestal bases, luminaires, fittings, mounting hardware, terminations, and all required accessories.

2.54 PARKING LOT LIGHTING FIXTURES

A. This item shall be paid for on a per each basis.

B. Includes light fixtures, poles, pole bases, luminaires, fittings, mounting hardware, terminations, and all required accessories.

2.55 POWER PEDESTALS

A. This item shall be paid for on a per each basis.

B. Includes power pedestals, receptacles, fittings, mounting hardware, terminations, and all required accessories.

2.56 MISC LIGHTING FIXTURES

A. This item shall be paid for as a lump sum item.

B. Includes flag pole lighting fixtures, entrance lighting fixtures, fittings, terminations, mounting hardware, configuration, and all required accessories.

2.57 INSTALL OWNER-FURNISHED RESTROOM BUILDING WITH PAVILION

A. This item shall be paid for as a lump sum item.

B. Includes receiving, storage, protection, and handling of owner-provided materials for restroom building with pavilion.

C. Includes all labor, overhead, equipment, materials, etc. required to install the restroom building with pavilion, complete in place, per the specifications of the SUPPLIER.

D. Includes coordination with SUPPLIER.

2.58 PARK GATEWAY ENTRANCE

A. This item shall be paid for as a lump sum item.

B. This item includes all labor, overhead, equipment, materials, etc. required to install bridge.

C. Includes untreated base course, footing, footing reinforcement, masonry work, jointing, sealers, metal fabrication, stone veneer, electrical, and finishing.

D. Includes structural engineering, shop drawings, etc. Coordination with engineer required prior to construction

E. Includes removing, moisture-conditioning, and re-placement, and re-compaction of subgrade soil.

F. Includes expansion joints.

G. Includes submitting all necessary wood, concrete, stone, and misc. material samples to City.

2.59 CONCRETE PAVERS ON CONCRETE BASE AND EDGE

A. This item shall be paid for on a square foot basis.

B. Includes untreated base course and concrete flatwork.

C. Includes removing, moisture-conditioning, and re-placement, and re-compaction of subgrade soil.

D. Includes scarification, moisture-conditioning, and re-compaction of exposed subgrade at base of excavation.

E. Includes expansion joints.

F. Item does not cover concrete flatwork included under another bid item such as areas covered by “COLORED CONCRETE FLATWORK W/ BASE” bid item.

2.60 STABILIZED STONE DUST SURFACE TRAIL

A. This item shall be paid for on a square foot basis.

B. Includes provision, excavation, transportation, processing, placement to elevations shown on plan sheets.

C. Includes all imported fill material required to construct project.

D. Includes tracking of subgrade areas overly disturbed by excavation efforts.

E. Includes all excess soil material required to be removed and disposed of off-site.

F. Includes aggregates, and other additives, etc. required for stone dust paving.

G. Includes, moisture-conditioning, and re-compaction of exposed subgrade at base of excavation.

2.61 3-RAIL SPLIT FENCE

A. This item shall be paid for on a lineal foot basis.

B. Includes rails, fence-posts, concrete footers, aggregate base, and backfill.

C. Includes scarification, moisture-conditioning, and re-compaction of exposed subgrade at base of excavation.

D. Includes all necessary materials and equipment, labor, overhead, excavation, backfill, subgrade preparations, compaction, and placement, in accordance with the construction drawings.

E. Includes submitting wood and hardware samples to City.

2.62 STONE VENEER COLUMNS

A. This item shall be paid for on a per each basis.

B. Includes stone veneer, stone caps, concrete footer and column, steel reinforcement, and all other material.

C. Includes scarification, moisture-conditioning, and re-compaction of exposed subgrade at base of excavation.

D. This item includes all labor, overhead, equipment, materials, etc. required to install the stone veneer columns.

E. Includes submitting stone veneer and cap samples to City.

F. Includes coordination with OWNER.

2.63 LANDSCAPE DECORATIVE BOULDERS

A. This item shall be paid for on a per each size of boulder (boulders should vary in size).

B. This item includes all labor, overhead, equipment, materials, etc. required to install boulders as shown on drawings.

C. Includes coordination with a Landscape Architect to review final placement

2.64 LANDSCAPE BOULDER RETAINING WALL

A. This item shall be paid for on a lineal foot basis.

B. Includes boulders, aggregate base, and backfill.

C. Includes scarification, moisture-conditioning, and re-compaction of exposed subgrade at base of excavation.

D. Includes all necessary materials and equipment, labor, overhead, excavation, backfill, subgrade preparations, compaction and testing, and placement, in accordance with the construction drawings.

2.65 6” MOW CURB

A. Item shall be paid for on a lineal foot basis measured by back of curb.

B. Includes concrete curb and untreated base course.

C. Includes removing, moisture-conditioning, and re-placement, and re-compaction of subgrade soil.

D. Includes scarification, moisture-conditioning, and re-compaction of exposed subgrade at base of excavation.

E. Includes expansion joints.

2.66 METAL EDGING

A. Item shall be paid for on a lineal foot.

B. This item includes all labor, overhead, equipment, materials, etc. required to install edging as shown on drawings.

C. Includes staking and adjustments to achieve smooth alignments and transitions

D. Included electrical connections for pumps and diffuser lines.

2.67 STACKED STONE STEPS

A. This item shall be paid for on a per each basis.

B. Includes stone slabs and any miscellaneous backfill necessary to create a level pad for placement of stones.

C. Includes scarification, moisture-conditioning, and re-compaction of exposed subgrade at base of excavation.

2.68 2” DECIDUOUS TREES

A. This item shall be paid for on a per each basis.

B. Includes excavation, loading, transport, and proper placement of plant material.

1. Includes any fees associated with the proper disposal of materials.

C. Includes all imported planting soil mix fill material, amendments, tree stakes, and mulch required to construct the project.

2.69 6’-8’ EVERGREEN TREES

A. This item shall be paid for on a per each basis.

B. Includes excavation, loading, transport, and proper placement of plant material.

1. Includes any fees associated with the proper disposal of materials.

C. Includes all imported planting soil mix fill material, amendments, tree stakes, and mulch required to construct the project.

2.70 5 GALLON PLANTS

A. This item shall be paid for on a per each basis.

B. Includes excavation, loading, transport, and proper placement of plant material.

1. Includes any fees associated with the proper disposal of materials.

C. Includes all imported planting soil mix fill material, amendments, and mulch required to construct the project.

2.71 1 GALLON PLANTS

A. This item shall be paid for on a per each basis.

B. Includes excavation, loading, transport, and proper placement of plant material.

1. Includes any fees associated with the proper disposal of materials.

C. Includes all imported planting soil mix fill material, amendments, and mulch required to construct the project.

2.72 FLATS

A. This item shall be paid for on a per each basis.

B. Includes excavation, loading, transport, and proper placement of plant material.

1. Includes any fees associated with the proper disposal of materials.

C. Includes all imported planting soil mix fill material, amendments, and mulch required to construct the project.

2.73 STONE MULCH 3” DEPTH WITH WEED FABRIC

A. This item shall be paid for on a cubic yard basis.

B. Includes excavation, loading, transport, and proper disposal of excess soil material.

1. Includes any fees associated with the proper disposal of materials.

C. Includes all labor, overhead, equipment, materials, etc., necessary to grade to elevations shown on plan sheets

D. Includes all labor, overhead, equipment, weed fabric, materials, etc. required for subgrade preparation.

2.74 TURF GRASS SOD/LAWN

A. This item shall be paid for on a square foot basis.

B. Includes excavation, loading, transport, and proper placement of sod material.

1. Includes any fees associated with the proper disposal of materials.

C. Includes all labor, overhead, equipment, materials, etc. necessary to grade to elevations shown on plan sheets.

D. Includes all imported planting soil mix fill material and amendments required to construct the project.

2.75 NATIVE/XERI-SCAPE SEED

A. This item shall be paid for on a square foot basis.

B. Includes excavation, loading, transport, and proper placement of hydroseed material.

1. Includes any fees associated with the proper disposal of materials.

C. Includes all labor, overhead, equipment, materials, etc. necessary to grade to elevations shown on plan sheets.

D. Includes all imported planting soil mix fill material and amendments required to construct the project.

2.76 FINE GRADING AND SOIL PREP

A. This item shall be paid for on a square foot basis.

B. Includes provision, transportation, processing, placement, grading, and proper compaction of material to elevations shown on plan sheets.

2.77 4”-12” DEPTH OF PLANTING SOIL MIX

A. This item shall be paid for on a cubic yard basis.

B. Includes excavation, loading, transport, and proper disposal of excess soil material.

1. Includes any fees associated with the proper disposal of materials.

C. Includes all labor, overhead, equipment, materials, etc. necessary to grade to elevations shown on plan sheets.

D. Includes all labor, overhead, equipment, materials, etc. required for subgrade preparation.

E. Includes provision, installation, soil testing, organic amendment testing, etc.

2.78 TOPSOIL 2” DEPTH

A. This item shall be paid for on a cubic yard basis.

B. Includes excavation, loading, transport, and proper disposal of excess soil material.

1. Includes any fees associated with the proper disposal of materials.

C. Includes all labor, overhead, equipment, materials, etc. necessary to grade to elevations shown on plan sheets.

D. Includes all labor, overhead, equipment, materials, etc. required for subgrade preparation.

2.79 IRRIGATION SYSTEM

A. This item shall be paid for as a lump sum item.

B. This item includes all labor, overhead, equipment, materials, etc. required to install irrigation system.

C. Includes all trenching, connections, etc., to provide proper coverage of all plant material

D. Includes coordination with the owner representative to provide training on controller programming, etc.

2.80 IRRIGATION CONTROLLER

A. This item shall be paid for as a lump sum item.

B. This item includes all labor, overhead, equipment, materials, etc. required to install irrigation controller.

C. Includes all trenching, connections, etc., to provide proper coverage of all plant material.

D. Includes coordination with the owner representative to provide training on controller programming, etc.

2.81 IRRIGATION POINT OF CONNECTION (POC)

A. This item shall be paid for as a lump sum item.

B. This item includes all labor, overhead, equipment, materials, etc. required to install irrigation point of connection.

C. Includes all trenching, connections, pressure testing, etc., to provide install of irrigation point of connection.

2.82 ASPHALT PUMP TRACKS

A. This item shall be paid for on a lump sum basis.

B. Includes field flagging/alignment verification.

C. Includes rough grading of (3) jump lines.

D. Includes import, staging, stacking, shaping, and compacting trail tread, landings, and bermed corners.

E. Includes purchase, shipping, staging, assembly, placing, and securing pre-fabricated jump lips.

F. Includes materials, shipping, construction, assembly of field built features, including necessary concrete foundations.

G. Includes test riding all jump lines by qualified riders to ensure proper spacing and speed.

2.83 JUMP LINES

A. This item shall be paid for on a lump sum basis.

B. Includes field flagging/alignment verification.

C. Includes rough grading of (3) jump lines.

D. Includes import, staging, stacking, shaping, and compacting trail tread, landings, and bermed corners.

E. Includes purchase, shipping, staging, assembly, placing, and securing pre-fabricated jump lips.

F. Includes materials, shipping, construction, assembly of field built features, including necessary concrete foundations.

G. Includes test riding all jump lines by qualified riders to ensure proper spacing and speed.

2.84 MULTI USE TRAIL W/ MTB SKILLS FEATURES

A. This item shall be paid for on a linear foot basis.

B. This item includes four (4) ability-specific downhill trails.

C. Includes field flagging/alignment verification.

D. Includes clearing/grubbing trail corridor.

E. Includes rough cutting of trail tread.

F. Includes import, staging, and placement of trail cap material.

G. Includes hand finishing of trail tread to the level indicated on the plans and specifications.

H. Includes supply and installation of pre-fabricated and field-built features.

I. Includes test riding all features by qualified riders to ensure proper spacing and speed.

J. Includes materials, shipping, construction, assembly of black line drop-in and blue line roll-ins, including necessary concrete foundations.

2.85 DOWNHILL FLOW TRAILS

A. This item shall be paid for on a linear foot basis.

B. This item includes four (4) ability-specific downhill trails.

C. Includes field flagging/alignment verification.

D. Includes clearing/grubbing trail corridor.

E. Includes rough cutting of trail tread.

F. Includes import, staging, and placement of trail cap material.

G. Includes hand finishing of trail tread to the level indicated on the plans and specifications.

H. Includes supply and installation of pre-fabricated and field-built features.

I. Includes test riding all features by qualified riders to ensure proper spacing and speed.

J. Includes materials, shipping, construction, assembly of black line drop-in and blue line roll-ins, including necessary concrete foundations.

2.86 TRAIL DRAINAGE CROSSING (OWNER-DIRECTED)

A. As the final trail alignments may vary from the provided centerlines shown in the plans due to unforeseen existing conditions, provide costs for each of the following. Alert OWNER to final quantity of each type of drainage crossing following trail layout and prior to installation of drainage crossings.

1. Standard pipe culvert trail crossing. Refer to detail 1 on sheet TR3.6. Provide Unit Price for a standard crossing.
2. Rock armoring for at-grade trail crossing. Refer to detail 2 on sheet TR3.6. Provide Square Foot price for Rock Armoring.

END OF DOCUMENT

MAPLETON
UTAH

01 64 00S
OWNER-FURNISHED PRODUCTS

ADD THE FOLLOWING TO THE END OF SECTION 01 64 00:

PART 1 GENERAL

1.5 SCHEDULE OF OWNER-FURNISHED PRODUCTS

A. OWNER to supply the following products to be installed by CONTRACTOR:

OWNER-FURNISHED PRODUCTS SCHEDULE				
ITEM	MANUFACTURER	MODEL/PART NO.	DESCRIPTION	QUANTITY
Restroom Building	Romtec, Inc.	Custom (Proj. # 2878A)	44'x22' restroom building with pavilion area.	1 EA
Drinking Fountain	Willoughby	CWBF-3FA-HC-SAH	Stainless steel, multi-user, surface-mount outdoor drinking fountain.	3 EA

END OF DOCUMENT

16010.1 DESCRIPTION

The General Conditions, Supplementary General Conditions, Alternates and Addenda, applicable drawings and the Technical Specifications herein shall apply to the providing and construction of a complete electrical system under the requirements of this Division 16.

16010.1.1 RELATED WORK AND REFERENCED SECTIONS

Section 01300 - Submittal Procedure
Section 02200 - Backfilling Trenches
Section 16150 - Electrical Control Devices
Section 16400 - Service and Distribution System

16010.1.2 SCOPE

A. The Work required under this Section consists of the Electrical General Requirements and related items necessary to complete the Work indicated within the Contract Documents.

B. This Section describes procedures and incidental items of Work relating to Electrical Division 16.

C. The drawings are diagrammatic, intended to indicate the general scope and location of the Work to be installed and are not to be considered as complete in every detail. The Contractor shall install all Work indicated and/or specified herein, complete in every way to perform the function (s) intended without additional cost.

D. Plans and Specifications are complementary; whatever is called for in either shall be as called for in both. In the event Work is called for in more than one place and is of conflicting requirements, the right shall be reserved to require the installation of the larger or the more expensive.

16010.1.3 CONTRACT DOCUMENTS

A. Contract documents consist of drawings, specifications, and other documents issued by the Engineer. Each is complementary and requirements shown, written or reasonably inferable therefrom on one is considered as written, shown and implied in all.

B. Electrical drawings are diagrammatic but shall be followed as closely as actual construction and Work of other Contractors will permit. Runs to panels from outlets referred to as “home runs” are indicated, by pointing in the general direction of panels. Contractor shall continue such circuits to the panels as though the routes were completely indicated.

C. Deviations from the Drawings required to make Work of this Contract conform to Building as constructed, or as to Work of other contractors or subcontractors, shall be made by the Contractor at his expense. The Engineer reserves the right to make minor changes in the location of equipment and outlets without additional charges.

D. The Contractor shall familiarize himself with the architectural and mechanical plans. The Contractor shall perform all Work and provide all material required by the electrical Contractor shown under these and all other sections of the plans and specifications.

16010.1.4 SUBMITTALS

All submittals shall meet the requirements of Section 01300 of these Specifications.

16010.1.4.1 SHOP DRAWINGS – Submittal of shop drawings shall be as follows:

A. Submittal of shop drawings shall meet the requirements of Section 01300 of these Specifications.

B. Shop drawings shall be submitted within fifteen (15) days after the award of contract.

C. Shop drawing shall include functional and descriptive literature of the particular item furnished complete with dimensional drawings, rough-in and installation instructions, knock-out locations, hangers or mounting devices, etc., as required for the proper checking and installation of the equipment. Catalog sheets without any reference made to the particular item will not be acceptable. All special features called for in the Contract Documents shall be noted. Where performance test results of a product design are called for in the technical sections of these specifications, test data sheets shall be provided with the shop drawing submittal.

D. Shop drawings shall be submitted for all switch gear, motor control centers, motor starters, control panels, telemonitoring panels, alarms, electrical controls, electrical instrumentation, communication devices and circuitry, lighting fixtures, and equipment anchors and supports for seismically supported components.

E. In connection with seismic restraint requirements, shop drawings are required for all equipment anchors, supports, and seismic restraints. Submittals shall include weights, dimensions, load/deflection data, centers of gravity, standard connections, manufacturer's recommendations, and behavior problems (vibration, thermal, expansion, etc.) associated with equipment so that the final design can be properly reviewed.

F. Three preliminary sets shall be submitted to the Architect/Engineer for their review. Following review, two sets will be returned to the Contractor for correction. After corrections have been made, the formal six sets of the corrected shop drawings shall be submitted for final review and distribution.

G. Each shop drawing required under this or other sections of Division 16 shall be bound together in sets in one hard back three ring binder per set, properly indexed for the formal submittal. Binders shall be properly sized to adequately contain all of the materials to be placed therein and shall be labeled to identity the Owner, the name of the job, the name of the Contractor and/or any sub-contractor (s), and any other pertinent information.

16010.1.4.2 MATERIALS LIST - A materials list including manufacturer, type, size, model number and other properties shall be submitted for all raceway, conduit, fittings, support materials, wire, cable, junction boxes, and wiring devices, including boxes for weather proof devices.

16010.1.4.3 EQUIPMENT/INSTRUMENT LIST - Equipment/Instrument list(s) including manufacturer, type, size, model number and other properties shall be submitted for all equipment and instruments.

16010.1.4.4 OPERATION AND MAINTENANCE MANUAL – The Contractor, or electrical subcontractor, shall assemble and deliver to the Owner an operation and maintenance (O&M) manual for the electrical systems furnished and installed in connection with the Work. O&M manuals shall be as follows:

A. Number of copies shall be as specified in Section 01300 or as required in the Special

Provisions or by the Engineer or the Owner. The O&M manual shall be reviewed and approved prior to the final inspection.

B. Each copy of the O&M manual shall be bound in a hard-backed binder. The front of each binder shall have the following information printed on it by silk screen process:

OPERATION AND MAINTENANCE MANUAL
FOR
(*PROJECT NAME*)
(*SPECIFIC SYSTEM NAME AND/OR LOCATION*, as appropriate)
(*OWNER'S NAME*)

C. Each copy shall contain a master index at the beginning of the manual showing all items included.

D. A separate section for each different type of item of equipment or information furnished shall be provided. Use plastic tab indexes for all sections of the book.

E. The first section of the manual shall consist of the names, addresses and telephone numbers of the Mechanical Engineer, Electrical Engineer, General Contractor, Electrical Contractor.

F. Descriptive literature (manufacturer's catalog cuts and other data) of each manufactured item shall be included. Literature shall show capacities and size of equipment used and shall be marked indicating each specific item with all applicable data underlined.

G. Operating instructions shall, at a minimum, include:

1. General description of the electrical system.
2. Where applicable, a step-by-step procedure to follow in putting each piece of electrical equipment in operation.
3. Provide diagram for the electrical control system showing the wiring of all related electrical control items, such as fuses, interlocks, electrical switches and relays.
4. Test results of all items requiring testing as called for in the technical section of specifications.

H. Maintenance instructions shall, at a minimum, include:

1. Manufacturer's maintenance instructions for each piece of electrical equipment installed in the project. Instructions should include installation instructions, parts numbers and lists, operation instructions of equipment, name of vendor, and maintenance and lubrication instructions.
2. A summary list of each piece of electrical equipment requiring lubrication, showing the name of the equipment, location, type and frequency of lubrication.
3. A complete list of all electrical equipment used indicating name, model, serial number and nameplate data of each item, together with number and name of each system with which the item is associated.

I. An approved copy of the manual shall be used during final inspection and shall be left with the Owner for its use and disposition.

16010.1.4.5 OTHER INFORMATION - Other information shall be provided as required by the Engineer.

16010.2 MATERIALS

All equipment and materials shall be as specified, new, of the best quality and free from defects. Each type of equipment or material shall be the same make and quality.

16010.2.1 UNDERWRITERS LABORATORIES

All equipment, materials, and devices shall be approved by Underwriters Laboratories, Inc. (UL). Custom designed items shall be fabricated using UL approved materials. All custom panels shall bear the UL label certifying UL-508 standards.

16010.2.2 MATERIALS AND EQUIPMENT TO BE SUPPLIED

The Contractor or electrical Subcontractor shall provide all materials, equipment, and any other fittings or devices required for a complete and finished installation. Materials and equipment shall be as shown on the Drawings and/or as called for in these Specifications, including the Special Provisions if any, unless otherwise approved, in writing, by the Engineer.

16010.2.3 APPROVAL OF SUBSTITUTIONS

Equipment and materials are designated by one or more manufacturer's name brands or numbers. It is not the intent of the Specifications to exclude other equipment or materials that equal the standard of those specified. If the Bidder, in its bid, desires to use equipment or materials other than those specified, the Bidder must obtain written approval from the Engineer in this regard at least seven (7) calendar days prior to bidding. Submit complete data, including detailed specifications and drawings with written request in duplicate. Samples may be requested if deemed necessary. Certificates of compliance with specifications or a list of all exceptions to the specifications shall be included with request.

16010.2.4 STORAGE OF EQUIPMENT AND MATERIALS

A. The Contractor shall be responsible for the proper transportation, unloading, storage, and holding of all electrical systems, materials, and equipment until they are installed in the Work, and accepted by the Owner. This shall include responsibility for damage, loss, theft, and pilferage.

B. Materials and equipment shall be handled and stored in accordance with the manufacturer’s and/or supplier’s instructions. Packaged items shall be stored in original, undamaged condition with manufacturer’s seals and labels intact. Materials and equipment shall be stored in a neat and orderly condition at all times and allowing for easy access for inspection.

16010.2.5 RACEWAYS AND FITTINGS

The manufacturer shall be Republic Steel, Triangle, National, Carlon, Allied or approved equal. All conduits shall be in accordance with the requirements of the National Electric Code (NEC) and applicable local codes. Steel conduit shall be in accordance with recommendations of the latest edition of American Iron and Steel Institute “Design Manual on Steel Electric Raceways.”

A. RIGID GALVANIZED STEEL CONDUIT (RGS)

1. Shall be USAS C80.1, zinc-coated by hot-dip galvanizing or sheradizing with additional enamel or lacquer coating.
2. Fittings shall be threaded type and of the same material as the conduit.
3. Unless otherwise noted, rigid metallic conduit shall be used for underground runs, under slab runs, and where runs are placed in concrete. It shall also be used

for exposed runs in mechanical rooms and for other exposed runs where the conduit is exposed to moisture, weather or mechanical injury.

4. Where rigid metallic conduit is used for underground installations, including elbows required to make sweeps in PVC conduit runs, the conduit shall be wrapped with 3m-50 10 mil pipe wrap or approved equal.

B. INTERMEDIATE METAL CONDUIT (IMC)

1. Shall be UL Standard 1242, hot-dip galvanized steel.
2. Fittings shall be threaded type and of the same material as the conduit.
3. It can be used for exposed runs in mechanical rooms and for other exposed runs where the conduit is exposed to moisture, weather or mechanical injury.
4. **This conduit shall not be used in hazardous areas.**

C. ELECTRICAL METALLIC TUBING (EMT)

1. Shall be in accordance with UL "Standard for Electrical Metallic Tubing" No. 797, galvanized mild steel with interior coat of enamel.
2. Fittings shall be steel compression type.
3. **Cast type, indenter, or set-screw type fittings shall not be used**.
4. EMT shall ONLY be used for exposed and concealed runs to lighting fixtures above 10 feet, unless otherwise specified, or above ceilings.
5. **This conduit shall not be used in hazardous areas.**

D. NON-METALLIC CONDUIT (PVC)

1. Shall be PVC Schedule 40 heavy wall suitable for direct burial.
2. Fittings shall be threaded or solvent welded type of the same material as the conduit.
3. **Shall not be used above grade or embedded in concrete, except as noted specified for runs above 600 volts. PVC shall not be used where exposed or concealed in walls or floors**.
4. PVC may be used for all underground runs, except for bends exceeding 22 degrees where jacketed or wrapped rigid galvanized steel is required, and runs under concrete slabs. Runs under concrete slabs shall be embedded in earth a minimum of 4 inches below the bottom of the slab. Risers through concrete slabs shall be rigid steel or intermediate metal conduit.
5. Provide PVC to steel adapters as required.

E. FLEXIBLE LIQUID-TIGHT CONDUIT

1. Shall be galvanized steel, liquid-tight, with moisture and oil- proof extruded PVC cover.
2. Fittings shall be liquid-tight, compression type.
3. Approved for flexible connections to equipment, items or instruments subject to vibration such as motors, fans, pumps, dry transformers, etc.
4. **Flexible Liquid-tight conduit shall not be less than 18 inches in length and not more than 3 feet in length**.

F. FLEXIBLE STEEL CONDUIT

1. Shall be galvanized steel.
2. Fittings shall be compression type of the same material as the conduit.
3. Shall be used for lighting fixture runs above drop ceiling grid systems or other devices required or approved by NEC or as requested or approved by the Engineer. (Install ground conductor per NEC in runs over 6 feet in length.)

G. PVC COATED CONDUIT

1. Rigid Steel conduit coated with a minimum of 40 mil of PVC coating shall be used in all corrosive areas or where required by NEC or the Engineer.
2. **All fittings, boxes, support materials, clamps, etc., used with PVC coated conduit shall be PVC coated in a like manner**.
3. Wiring devices shall be corrosion resistant UL rated in corrosive areas requiring PVC coated conduit.

H. WALL AND FLOOR SLEEVES

Shall be galvanized sheet steel or pipe.

I. CLAMPS

1. Shall be galvanized malleable iron one-hole straps, beam clamps or other approved device with necessary bolts and expansion shields.
2. **Perforated metal straps shall not be used**.

J. CONDUIT SIZES

1. Shall be as indicated on the drawings.
2. **Shall not be smaller than ¾ inch exposed or 1 inch buried conduit unless otherwise specifically approved by the Engineer**.

K. CONDUIT BUSHINGS

1. For conduit 1-1/4 inch and larger use OZ type BLG or SBLG with Lay-in-Lug.
2. Use Lay-in-Lug bushings on multiple conduit entrances to enclosures or gutters.
3. Bonding bushings shall be used on conduits containing service entrance conductors.

L. ENTRANCE SEALS

Provide and install OZ entrance seals on all conduits entering building below grade.

M. RACKS AND SUPPORTS

1. Conduit support racks, Unistrut supports and fittings, etc., shall be hot-dipped galvanized, except in corrosive areas where the supports and fittings must be PVC coated.
2. **Painted metal supports are not allowed**.

N. PULL BOXES

1. Pull boxes, which are required for proper conduit installation, shall be sized according to the requirements of Article 314 of the NEC.
2. Conduit bodies shall be cast type with threaded hubs.
3. Outdoor, buried pull boxes shall be Oldcastle H-Series or equal.
   a) Pull boxes shall be sized per NEC 314.28.
   b) If fully enclosed pull boxes are used, they shall be coated with coal tar epoxy per specification 9900.3.2.4.

O. OUTLET/JUNCTION BOXES

1. Boxes shall be provided in the wiring or raceway systems wherever required for routing/pulling of wires, making connections and mounting of devices or fixtures.
2. Boxes in exposed conduit runs shall be cast metal condulets with threaded hubs installed exposed. **Non-metallic boxes are not allowed**.
3. Each box shall be metal and shall have the volume required by the National Electrical Code for the number of conductors enclosed in the box. Boxes for mounting lighting fixtures shall not be less that 4 inch octagonal or 4 inch square except that smaller boxes may be installed as required by fixture configuration, as approved. Boxes in the raceway system shall not be less than 1-1/2 inches deep, except where shallower boxes required by structural conditions are approved.
4. Boxes for other than lighting fixture outlets shall not be less than 4 inches square.
5. Boxes in concealed conduit runs shall be equipped with tile extension rings, device mounting straps and accessories required for the purpose of the outlet.

16010.2.6 A. CONDUCTORS

1. Shall be of the type, size, and locations as shown on the Drawings and meet the requirements of the latest addition of the National Electric Code (NEC).
2. Shall be soft-annealed coated copper in accordance with ASTM B33 or B189.
3. Conductors No. 10 and smaller shall be solid copper for lighting circuits only, all other circuits shall be stranded copper.
4. All conductors shall be THHN/THWN copper rated at 600 volts, unless otherwise noted.
5. **Aluminum conductors will not be allowed**.

B. GROUNDING CABLE

Shall be as called out on the drawings and per NEC. (Grounding lugs shall be the clamp type made of high conductivity copper alloy and shall be provided for all equipment to be grounded.)

C. VFD CABLE

Conductor size shall be as shown in Plans and shall meet the requirements of the latest addition of the National Electric Code (NEC). Cable shall meet the requirements below:

6. Cable shall be designed for VFD applications and shall be rated 600V/2kV, NEC Type TC with a 90°C rating.
7. Three Copper circuit conductors with XLPE insulation.
8. Three symmetrical copper ground wires.

9. Spiral copper tape shield with 100% coverage.
10. Outer PVC jacket.
11. Suitable for Indoor, Outdoor, Burial and Oil Resistance

Acceptable manufacturers:

1. Belden
2. Southwire
3. Approved Equal

16010.2.7 SPLICES, TAPS AND TERMINATIONS

A. Splices, taps and terminations made in interior damp or wet locations, corrosive atmosphere locations or exterior boxes above or below grade shall be covered with 3M heat shrinkable ITCSN series sleeves or end caps or Raychem equal as approved by the Engineer.

B. All splices shall require approval by the Engineer.

16010.2.8 SAFETY SWITCH DISCONNECTS

A. Provide disconnect switches where shown and required by NEC as specified herein.

B. Type: Heavy duty, manual, single throw, fusible or non-fusible as indicated.

C. Rating: 600 volt, ampere size as noted or as required for load served.

D. Enclosure: Nema 4, Gasketed stainless steel or as called out in equipment schedule on drawings. Stainless steel 316 shall be used in hazardous/corrosive areas. Stainless steel 304 shall be used in all other locations.

E. Fuses: Switches shall be equipped with Type "R" fuse clips factory installed. Fuses shall be dual element type RK5 of size as noted.

F. Non-Fusible Switches: For equipment 2 horsepower and smaller, shall be horsepower rated; toggle switch type; quantity of poles and voltage rating as indicated. For equipment larger than 2 horsepower, switches shall be the same as fusible type.

16010.2.9 JUNCTION BOXES

A. Junction or pull boxes, which are required but not shown, shall be sized according to requirement of Articles 370 and 373 of NEC.

B. Shall be cast type condulets with threaded hubs.

16010.2.10 WIRE DEVICES

A. Switches: 20 ampere, 120/277 volt, toggle type. Single pole used as designation for entire series - double pole, 3-way, 4-way or lock type. Hubbell #1221, Bryant #1221, Leviton #1221. Switch and pilot shall be Hubbell #1221-PL or Leviton #1221-PL. Double pole toggle switch shall be Hubbell #1222-2.

B. Ground Fault Interrupter Receptacles: 20 ampere, 125 volt, NEMA 5-20R, gray color. Leviton #6398.

C. Receptacles: 20 ampere, 125 volt, NEMA 5-20R, gray color for locations where indicated. Hubbell #5352, Bryant #5352, or Leviton #5352.

D. All devices shall be gray in color.

E. Special receptacles other than those listed above shall be as designated on the drawings.

F. Device Plates:

1. For surface mounted boxes plates shall be stainless steel suitable for use on cast metal device boxes, condulet FS and FD types. Shall be complete with gaskets and approved for wet locations.

2. For flush boxes in finished areas, plates shall be stainless steel. Gang plates shall be one-piece.

16010.3 CONSTRUCTION REQUIREMENTS

Unless notified otherwise, the Contractor responsible for the electrical Work shall perform all electrical work in accordance with the Drawings and with these Specifications.

16010.3.1 CODES, PERMITS, LICENSES AND STANDARDS

A. PERMITS AND LICENSES – The Contractor shall secure all permits and licenses required in connection with this work.

B. CODES AND STANDARDS - All work, labor, and equipment shall conform to applicable State and Local Codes and Standards and the applicable sections of the latest revisions of the following:

- American Society for Testing and Materials (ASTM)
- National Fire Protection Association, National Electrical Code (NEC)
- Insulated Power Cable Engineers Association (IPCEA)
- Underwriters Laboratories Inc. (UL)
- American Steel and Iron Institute, “Design Manual on Steel Electrical Raceways”
- National Electrical Manufacturer’s Association (NEMA)
- American National Standards Institute (ANSI)
- Institute of Electrical and Electronic Engineers (IEEE)
- Uniform Building Code (UBC)
- Uniform Fire Code (UFC)
- Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

Conflicts between any of the above referenced codes and standards and between any of them and these Specifications and/or the Project Drawings shall be resolved by complying with the more stringent requirements.

16010.3.2 SAFETY

A. REGULATIONS - The Contractor’s work shall conform to the Associated General Contractors of America, Inc. *Manual of Accident Prevention in Construction* and shall comply with all current regulations of the Occupational Safety and Health Act (OSHA) as required for work identified on the Drawings or in these Specifications.

B. SAFETY GUARDS - All equipment, which the Contractor furnishes and installs, shall be provided with appropriate safety guards for prevention of accidents. The Contractor shall provide and maintain any other necessary construction required to secure safety of life or property, including the maintenance of sufficient lights to secure such protection.

16010.3.3 DIAGRAMMATIC DRAWINGS

A. The electrical drawings are diagrammatic, intended to indicate the general scope and locations of the work to be installed and are not to be considered as complete in every detail. The Contractor shall install all work indicated and/or specified herein, complete to perform the function intended without additional cost.

B. The electrical drawings are diagrammatic, however, they shall be followed as closely as actual construction and work of other contractors will permit. Runs to panels from outlets, referred to as "home runs", are indicated on the drawings by arrows pointing in the general direction of panels. Contractor shall continue such circuits to the panels as though the routes were completely indicated. Deviations from drawings required to make the work of this Contract conform to building as constructed, or as to work of other contractors, shall be made at the Contractor's expense. The Engineer reserves the right to make minor changes in the location of equipment and outlets without additional charges.

16010.3.4 SITE EXAMINATION

Examination of the site shall be made by the Contractor, who shall compare it with the drawings and specifications and satisfy himself as to the conditions under which the work is to be performed. The Contractor shall, at such time, ascertain and check all conditions which may affect its work. No allowance shall subsequently be made in the Contractor's behalf for any extra expenses to which the Contractor may be put due to failure or neglect on its part to make such examination and determination of the condition.

16010.3.5 SUPERVISION

A. A competent foreman or superintendent, approved by the Owner's Representative, shall be at the site at all times to receive instructions and shall have the proper authority to act on behalf of the Contractor. The Contractor shall verify dimensions given on the electrical drawings and report any errors or inconsistencies to the Engineer before commencing the work. The Engineer or its representative will interpret the meaning of the Drawings and Specifications where questions arise.

B. Contractor shall assign persons to be in direct charge of work who are thoroughly experienced in the types of construction work specified herein. All labor shall be performed in a workmanlike manner by skilled workmen under the supervision of competent foremen.

16010.3.6 WORKMANSHIP

Workmanship shall be in accordance with the best present-day construction methods and shall be neat and orderly throughout the project.

16010.3.7 COORDINATION OF CONSTRUCTION

A. The Contractor shall coordinate work with other contractors, subcontractors, the Owner, and the Engineer to assure orderly and expeditious progress of work. The Contractor shall select order/sequence of work and establish schedule of working hours for construction, all subject to review and direction by the Owner.

B. This Contractor shall be held solely responsible for the proper installation of its work. The Contractor shall arrange with the proper contractors for the installation of anchors and other embedded devices, and for the leaving of required chases, openings, etc., and shall do all cutting and patching made necessary by its failure or neglect to make such arrangements with others. Any cutting or patching done by this Contractor shall be subject to the directions of the Engineer and shall not be started until approval has been obtained.

C. All cutting, welding or drilling of concrete or structural members shall be properly reinforced and patched to match as nearly as possible the surrounding work. Before cutting, welding or drilling any concrete or structural member, the Contractor shall secure the approval of the Engineer. Where deemed appropriate by the Engineer, in the case of gross negligence pertaining to this issue, the Engineer reserves the right to back-charge the Contractor for the Engineers associated costs.

16010.3.8 **INSTALLATION**

RACEWAY AND FITTINGS

A. STANDARDS

1. All conduit to be installed in accordance with the requirements of the National Electrical Code, latest addition.
2. Steel conduit to be installed in accordance with recommendations of American Iron and Steel Institute “Design Manual on Steel Electrical Raceways”, latest addition.
3. PVC coated conduit installed in accordance with manufacturer instructions.

B. ELECTRICAL CONTINUITY

All metallic conduit systems shall be electrically continuous throughout.

C. MOISTURE

1. All conduit raceway systems shall be essentially moisture tight.
2. Conduit drainage shall be accomplished by sloping conduits towards manholes or boxes.
3. Where pockets cannot be avoided in exposed conduits, provide drainage fittings or weep holes. Weep holes drilled through the walls of any conduit or fitting shall not produce burrs on the inside or outside surface.

D. ALIGNMENT OF EXPOSED CONDUIT

Install conduit runs parallel or at right angles to lines of structure.

E. FIELD CUTS AND THREADS

1. Field cuts shall be made square, threads clean and sharp.
2. Remove burrs, sharp or rough edges by reaming.
3. Before couplings or fittings are attached, apply a coat of red lead or zinc chromate to male threads of RGS or IMC conduit, also apply these coatings or other special compound recommended by the manufacturer of the conduit where the conduit protective coating is damaged.

4. PVC coated conduit system requires male threads on conduit, elbows and nipples and all female threads on fittings or conduit couplings to be protected by application of a urethane coating.
5. **Care must be taken to assure that concrete surfaces are protected from cutting oil, any/all damage will be the responsibility of the Contractor**.

F. BENDS

1. Uniform, whether job-fabricated or made with standard fittings or boxes.
2. Do not dent or flatten conduit
3. Conduit installation should be installed symmetrically insofar as practicable.
4. Unless approved otherwise, bends larger than 1-1/4 inch shall be factory made.
5. Bends in exposed conduit shall be symmetrical insofar as practicable.
6. Do not expose bends at floor or ceiling.

G. LOCATION

1. Conduit routing is generally shown in schematic fashion, unless dimensioned or noted to the contrary.
2. Contractor is responsible to route conduits as required to connect equipment or devices.
3. Vertical risers, equipment and device locations are approximately as indicated on the drawings. Contractor shall coordinate installation of conduit with structure and equipment.
4. Contractor is responsible to coordinate conduit installation with other contractors installations, in the event of conflict, field routed conduit shall be moved at the Contractors expense.
5. Conduit shall be located a minimum 6 inches away from steam, hot water, or other hot surface. Protect from heat, as Engineer approved, if the 6 inch separation is impracticable.
6. Diagonal installation is not permitted.

H. BURIED/EMBEDDED CONDUIT

1. RGS conduit installed underground, or used in PVC runs for sweeps larger than 22 degrees, must be wrapped with 3M-50 10 mil pipe wrap, approved asphalt compound or approved equal.
2. Mid-run weep holes and gravel drainage pockets will not be permitted.
3. Conduits embedded in concrete or masonry shall be securely held in place during concrete placement and construction operations.
4. In concrete floors, conduit shall be set before pouring of concrete begins. Conduit shall be routed in a direct line, with bends as long as possible, with 2 inches minimum from conduit to bottom of slab and maximum conduit size of 2 inch, unless otherwise approved.
5. Non-metallic conduits above 600 Volts shall be encased in red concrete covered by a minimum of 2 inches on all sides.
6. Buried conduit shall be placed 18” below grade, then filled to grade with flowable fill concrete.
7. If minimum of 18” cannot be reached, 3000 psi concrete shall fill the trench to grade .

I. WALL PENETRATIONS

1. Penetrations through exterior building walls to be by core drilling and providing appropriate conduit entrance seals.

2. Openings through existing partitions shall be provided at Contractor's expense. Holes through masonry construction shall be drilled with suitable core drilling machine.
3. All work is to be performed neatly.
4. Patches shall match original material in composition and appearance.
5. Provide fire seals as detailed or required by NEC where a fire rated wall or partition is penetrated.
6. A template shall be provided by the Contractor to hold conduit groups terminating together or passing through fire walls or floors.
7. In walls and partitions, conduit shall be installed vertically. If vertical installation is impracticable, the Engineer shall approve horizontal installation for each location.

J. EXPANSION FITTINGS

Install expansion fittings in all conduit runs crossing structural expansion joints and in all straight conduit runs exceeding 75 feet in length.

K. CONDUIT ENDS

1. Insulating bushings shall be installed at open conduit ends, terminating in panels, control centers, consoles or other similar locations.
2. Plug space around cables with oakum and/or an approved sealing compound where conduits enter switchboards, cabinets or similar locations.
3. Cap or plug all spare conduit ends to prevent the entrance of foreign material.

L. CONDUIT CONNECTIONS

1. At cabinets and boxes use double locknuts and insulating bushings for rigid conduit.
2. At cable tray securely clamp conduit to tray and install insulating bushings.
3. Install insulated grounding bushings with lay-in ground lugs where metallic conduit terminates in non-metallic manholes or pullboxes.
4. Flexible conduit for connection to movable/vibrating equipment shall be liquid-tight, Sealtite as manufactured by Anaconda Metal Hose Company, or approved equal, utilizing approved liquid-tight fittings.

M. SUPPORTS

1. Hangers and supports shall be galvanized or PVC coated.
2. Hangars generally are not detailed, but must be adequate to support combined weight of conduit. Rigid fastenings are to spaced at a maximum of 6 feet.
3. Clamps will be galvanized malleable iron one-hole straps, beam clamps or other approved device with necessary bolts, washers and expansion shields.
4. **Perforated metal straps shall not be used**.
5. Adjustable hangers shall be used to support horizontal runs only, use trapeze hangers for parallel runs of conduit. Install u-bolts or other approved clamping device at each end and at each elbow. Install clamp every third intermediate hanger for each conduit.

N. CONDUIT CLEANING

Contractor is to clean and swab the inside of conduits, by mechanical means, to remove foreign materials and moisture before conductors are installed.

O. SPARE CONDUITS

1. Spare conduits shall have a nylon pulling line installed for future installation of cables.
2. Recessed panels shall have three 1 inch spare conduits in the wall space stubbed-out above ceiling and three 1 inch spare conduits stubbed under the floor.
3. Spare conduits shall be capped.

CONDUCTOR INSTALLATION

A. BENDING RADII

Not to be less than permitted by ICEA and/or NEC.

B. SUPPORTS IN VERTICAL RUNS

To be in accordance with NEC requirements.

C. SPLICING

1. Will be permitted only with Engineers approval, and will be held to an absolute minimum.
2. Permitted only in junction boxes or similar accessible locations.
3. Cover with heat shrinkable sleeves to make moisture proof and corrosive resistant.
4. No splicing of instrument or control wiring shall be allowed without specific approval, by the Engineer.

D. CONNECTORS

1. Solderless compression or mechanical type will be utilized where screw does not bear directly on the wire.
2. Apparatus lugs, conductor, and coat shall be thoroughly cleaned with suitable oxidation inhibiting compound prior to connection.
3. Retaining cup washers shall be used where solid wire is used at terminal blocks.
4. Compression type connectors shall be installed using ratchet type crimping tools that will not release until full compression has been achieved.
5. Dies for the crimping tools shall be matched to the connector and approved for use by the Engineer and the connector manufacturer.
6. Twist on type, Scotch-lok or approved equal, connectors shall be restricted to the connection of lighting fixture wires only.

E. POWER CABLES

All power cables will be installed in strict accordance with the manufacturers instruction, and in conformance with NEC.

F. CONNECTIONS

All apparatus lugs shall be tandem single or multi-barrel lugs as detailed/required.

G. CONDUCTOR PULLING

1. Use pulling grips or eyes.

2. Firmly mount pulling reels on portable stand and secure against displacement
3. Use an approved by the Engineer commercial pulling compound for lubrication.
4. Monitor and do not exceed cable-pulling tension as specified by the cable manufacturer.

H. COLOR CODING

1. Single phase service - use white for neutral conductor, and black for ungrounded conductors.
2. Three phase service - feeder and branch conductors shall be color coded as follows:

	120/208 Volt	277/480 Volt
a.	Phase A – Black	Brown
b.	Phase B – Red	Orange
c.	Phase C – Blue	Yellow
d.	Neutral – White	Grey
e.	Ground – Green or Bare	Green or Bare

3. Coding shall be by insulation color or minimum 1 inch band of colored tape.
4. Green covering of conductors shall be solely for grounding.

I. PHASING

1. Where common neutral is run for two or three circuits, phase conductors shall be connected to breakers in the panel, which are connected to different phase legs.
2. Home runs may be combined at the option of the Contractor, providing not more than three circuits are installed in one conduit, unless otherwise approved by the Engineer.

J. SERVICE SYSTEMS

1. Incoming service systems shall be grounded at two points with the UFER (ground wire tied to the rebar of the footings) and to driven ground rods as indicated on the Standard Detail Drawing.
2. Jumpers shall be provided around water meters and any dialectric sections of pipe.
3. Size shall be as indicated on the Drawings and/or as required by NEC.
4. Connections shall be accessible for inspection.
5. Neutral conductor connection to grounding electrode conductor shall be at the main service enclosure only.
6. Type of equipment and details of installation shall be verified with Power Company representatives.
7. Metering equipment shall be provided as indicated on the Drawings or as required by these Specifications.

16010.3.9 INSTALLATION OF POWER AND CONTROLS TO EQUIPMENT

Contractor shall provide all power and control wiring required for the work of other trades as described on the drawings and in the specifications, except where the furnishing and installing of such wiring is specified elsewhere. Connect cord sets to Owner furnished equipment and make connections to all electric power consuming equipment whether furnished under contract or by Owner.

16010.3.10 TEMPORARY ELECTRIC SERVICE DURING CONSTRUCTION

A. The Project Contractor is responsible for all project electrical work unless otherwise noted. The Contractor shall be aware, however, that some or all of the project electrical work may be performed by the Owner and/or an independent electrical contractor. The division of work to be performed by others may be indicated on the drawings, or may be as called for by the Engineer. But, the Contractor shall be responsible to review the Drawings and consult with the Engineer, to determine if its scope is less than one hundred percent of all project electrical work. The Contractor shall also be responsible to coordinate and schedule its work with that of the Owner or independent electrical contractor, and to leave its installations ready, with the connecting wires coiled, for the Owner or independent contractor to connect to or to terminate as necessary, thereby ensuring the most efficient completion of the project by all parties.

B. The Contractor or electrical subcontractor doing the work shall provide temporary power, complete with metering and wiring, for lighting and power outlets for construction tools and equipment. This contractor will make arrangements with the local power company for temporary electrical service connections for construction power.

C. No attempt shall be made herein to specify construction power requirements for equipment in detail. However, all temporary wiring shall meet NEC, Article 305, requirements. The service shall be provided with a main disconnect, and all power receptacles shall be, or be protected by, appropriately rated GFI single-pole devices.

D. At completion of the Project, or sooner if directed, the temporary power supply shall be disconnected and removed from the construction site.

E. During construction, if it becomes necessary to shut down power to a critical item of equipment or process, the Contractor or electrical subcontractor shall provide the necessary wiring and a portable generator or other source of electric power to keep such critical equipment or process in operation.

16010.3.11 SEISMIC RESTRAINT

A. The appropriate Seismic Zone Classification will be provided on the Drawings or in the Special Provisions. All electrical equipment shall be securely anchored and seismically braced in accordance with the regulations contained in the most recently adopted edition of the UBC and with the SMACNA *Guidelines for Seismic Restraints of Electrical Systems* as they pertain to the Seismic Zone Classification given.

B. Units mounted and secured directly to structures shall be provided with connectors of sufficient strength to meet the restraining criteria.

C. All electrical equipment which is to be securely anchored (hard mounted) to the building or structure shall have supports designed to withstand lateral and vertical "G" loadings equal to or greater than UBC requirements and SMACNA guidelines for the given seismic zone.

16010.3.12 LABELING OF J-BOX COVERS

All J-Box covers shall be labeled with information showing the voltage and the circuit number in reference to each home run pulled through that J-Box and a particular run of conduit. The Contractor shall continue such circuits to the panels as though the routes were completely indicated.

16010.3.13 REPAIR OF WORK

A. The work shall be carefully laid out in advance and where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings or other surfaces is necessary for the proper installation, support, or anchorage of the conduit raceways or other electrical work, this work shall be carefully done. Any damage to building, piping or equipment shall be repaired by skilled mechanics of the trades involved, at no additional cost to the Owner.

B. Penetrations within fire rated wall assemblies shall be appropriately repaired and replaced to full integrity of the designed fire resistance of the wall.

16010.3.14 TESTING

On completion of the work, the installation shall be tested free from all grounds and short circuits. Normal feeders, circuits, and service entrance conductors with wire size #2 and larger shall be tested for leakage phase-to-ground and phase-to-phase prior to energizing the electrical system. The Contractor shall submit a written report to the Engineer showing methods used and readings taken. Voltage applied for testing shall not exceed two times normal operating voltage.

16010.3.15 GUARANTEE/WARRANTY

A. The following guarantee is a part of the specification and shall be binding on the part of the Contractor:

"The Contractor guarantees that this installation is free from defects. The Contractor agrees to replace or repair, to the satisfaction of the Owner's Representative, any part of this installation which may fail or be determined unacceptable within a period of one (1) year after final acceptance."

B. Electrical systems and equipment shall not be considered acceptable for substantial completion until they have performed in service continuously without malfunction for at least ten (10) days.

16010.3.16 DEFECTIVE EQUIPMENT

If equipment fails to conform to the Specifications or to operate satisfactorily, the Owner will have the right to operate said equipment until defects are corrected. The Owner will have the right to operate rejected equipment until it is replaced, without cost for depreciation use or wear. The Contractor shall remove defective equipment from operation for examination, adjustment, alteration, or change only at times approved by Owner.

16010.3.17 CLEAN-UP

A. As the work progresses, and on a daily basis, the Contractor shall remove from the premises and surrounding streets, alleys, etc., all rubbish and debris resulting from its operations and shall leave all equipment and material furnished by the Contractor absolutely clean and ready for use.

B. In addition, the Contractor shall periodically remove all debris and waste in order to maintain safe working and operating conditions, and shall dispose of the same in an approved manner. At the completion of work, The Contractor shall remove all its rubbish, tools, scaffolds and surplus materials from and about the site, leaving its work clean and the areas ready for occupancy.

16010.3.18 AS-BUILT DRAWINGS

Blue line white prints of drawings will be furnished by the Engineer, on which the Contractor shall accurately and neatly mark, in colored pencil, all changes or deviations from the drawings as such changes are made in the work. These drawings shall be reviewed with the Engineer on a timely basis, not to exceed at least once each month. Failure to keep as-built drawings up to date shall be cause for withholding monthly or final payment.

16010.3.19 FINAL INSPECTION AND ACCEPTANCE

The Contractor shall notify the Engineer when work is considered to be complete, in full operating condition, and ready for final inspection. The Engineer, after determining that the installation is ready for final inspection, will conduct the final inspection and tests as are deemed necessary to determine that the provisions of the specifications are satisfied. The Owner will not accept work nor make final payment to the Contractor until Engineer has certified that the work of the Contractor is complete and in conformance with the specifications and guarantees.

16010.4 METHOD OF MEASUREMENT

16010.4.1 NO SEPARATE MEASUREMENT

Separate measurement shall NOT be made for furnishing or installing electrical systems, components, materials required to be installed within the pay limits for a building or enclosure identified in the Bid schedule to be furnished by the Contractor.

16010.4.2 SEPARATE MEASUREMENT

A. NEW BUILDINGS - Separate measurement shall be made for installation of electrical systems, components, and materials, required for a building or enclosure shown on the Drawings and as called for in these Specifications and identified in the Bid Schedule, when such electrical systems, components, and materials are identified and listed in the Bid Schedule.

B. EXISTING BUILDINGS - Separate measurement will be made for installation of electrical systems, components, and materials, required to be installed or replaced in an existing building or enclosure, as shown on the Drawings and as called for in these Specifications, when such electrical systems, components, and materials are identified and listed in the Bid Schedule.

16010.5 BASIS OF PAYMENT

16010.5.1 No separate payment shall be made for furnishing or installing electrical systems, components, or materials required to be installed within the pay limits for a building or enclosure identified in the BID schedule to be furnished by the Contractor.

PAY ITEM	UNIT
Electrical System *(Indicate Building)*	Lump Sum
Install Electrical *(Describe Component)*	Lump Sum
Install Electrical *(Describe Component)*	Each
Install Electrical *(Describe material)*	Lump Sum
Install Electrical *(Describe material)*	Lineal Foot
Replace Electrical *(Describe Component)*	Lump Sum
Replace Electrical *(Describe Component)*	Lump Sum
Replace Electrical *(Describe material)*	Lump Sum
Replace Electrical *(Describe material)*	Lineal Foot

16150. 1 GENERAL

16150.1.1 QUALITY ASSURANCE

A. Comply with NFPA 70 requirements for electrical materials and installation.

B. Provide products and components which have been UL listed and labeled, including UL marks indicating special type usage whenever applicable.

16150.2 PRODUCTS

16150.2.1 MOTOR STARTERS

A. Acceptable Manufacturers:

1. Allen-Bradley Co.
2. Eaton Corp/Power Distribution Div.
3. Cutler Hammer
4. General Electric Co. (GE Supply)
5. Square D Co.

B. Provide factory fabricated starters complying with NEMA Standards Publication ICS 2 with NEMA Type enclosures as specified in Section 16010.

C. Provide starters with thermal overload protection on each phase utilizing interchangeable melting alloy, Class 20 (trip in 20 seconds or less when carrying a current equal to 600 percent of its current rating) overload heaters, sized in field for full load current rating indicated on each motor nameplate.

D. Manual Motor Starter: Quick-make, quick-break trip free toggle or pushbutton operating mechanism; provisions for positive padlocking in OFF position.

E. Magnetic Motor Starter: Non-reversing or reversing, as indicated; manual reset overload relay with reset button on face of enclosure; full voltage starting; control transformer of sufficient capacity to handle operating coil and associated controls, integral with each starter; 120 volts control circuit, fuse protected; equipped with pilot light.

16150.2.2 CONTACTORS

A. Acceptable Manufacturers:

1. Allen-Bradley Co.
2. Eaton Corp/Power Distribution Div.
3. Culter Hammer
4. General Electric Co. (GE Supply)
5. Square D Co.

B. Provide contactors complying with NEMA Standards Publication ICS 2 with NEMA Type enclosures as specified in Section 16010, unless otherwise indicated.

16150.2.3 RELAYS

A. Acceptable Manufacturers:

1. Control Relays:

2. Allen-Bradley Co.
3. IDEC Systems & Controls Corp.
4. Omron Electronics, Inc./Control Components Div.
5. Potter & Brumfield
6. Square D Co.

B. Provide relays complying with NEMA Standards Publication ICS 2 with NEMA Type enclosures as specified in Section 16010, unless otherwise indicated.

16150.2.4 CONTROL PANELS

A. Acceptable Manufacturers:

1. Allen-Bradley Co.
2. Eaton Corp/Power Distribution Div.
3. Cutler Hammer
4. Square D Co.

B. Provide factory fabricated oiltight pushbuttons, selector switches, pilot (indicating) lights, and pushbutton stations complying with NEMA Standards Publication ICS 2, heavy duty, with NEMA Type enclosures as specified in Section 16010.

1. Fabricate pushbutton stations for vertical or horizontal mounting, as indicated, and with button and light arrangements, as indicated on drawings.

C. Pushbuttons: Momentary or maintained contacts, as indicated; contacts rated 10 amps continuous carrying current, 600 volts AC; quick-make, quick-break, snap action operating mechanism.

D. Selector Switches: Rotary type; two or three position control, as indicated; legend plate with markings as indicated.

E. Pilot Lights: Transformer type, 120 volts AC; glass or acrylic plastic prismatic lens, color as indicated; legend plate with markings as indicated.

16150.2.5 CIRCUIT AND MOTOR DISCONNECTS

A. Acceptable Manufacturers:

1. Cutler Hammer
2. Allen-Bradley Co.
3. Siemens Corp/Electrical Apparatus Div.
4. Square D Co.
5. General Electric Co. (GE Supply)

B. Provide factory fabricated switches complying with NEMA Standards Publication KS 1 with NEMA Type enclosures as specified in Section 16010.

C. Safety Switches: 3 pole, heavy-duty, horsepower rated disconnect; rated at 600 volts; quick-make, quick-break operating mechanism; integral operating handle provided with means for positive padlocking in OFF position; current carrying parts constructed of high conductivity copper, with silver-tungsten type switch contacts; fusible or non-fusible as indicated; positive pressure type reinforced fuse clips for fusible switches.

D. Fuses: Dual element type, with time delay; non-renewable; current limiting where indicated.

16150.2.6 TRANSFER SWITCHES – MANUAL

A. Acceptable Manufacturers:

1. Cutler Hammer
2. Square D Co.
3. General Electric Co. (GE Supply)

B. Provide manual transfer switches complying with NEMA Standards Publication KS 1, specifically designed to transfer power from one load to another load, with NEMA Type enclosures as specified in Section 16010.

C. Manual Transfer Switches: Double throw, 3 pole, heavy-duty, safety switch; rated at appropriate amperes, 600 volts; quick-make, quick-break operating mechanism; blades visible from front of unit for positive indication that switch is OFF; integral three position operating handle provided with means for positive padlocking in OFF position; current carrying parts constructed of high conductivity copper, with silver-tungsten type switch contacts; non-fusible.

16150.3 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

16150.3.1 These control devices shall be considered pertinent to the equipment which they are associated with. They will not be measured or paid for separately, but shall be included in other appropriate bid items.

16400.1 GENERAL

16400.1.1 APPLICABLE SECTIONS

The General Conditions, Supplementary General Conditions, Special Conditions, Alternates and addenda, applicable drawings and the technical specifications herein shall apply to all work under this Division 16.

16400.1.2 SCOPE

Provide all operations, methods, labor and equipment and provide and install all materials and incidentals necessary for the completion of the work as specified herein or included on the drawings.

16400.1.3 WORK INCLUDED

A. Electrical work required for this work is shown on the drawings and includes, but is not necessarily limited to:

1. Complete new electrical distribution system for power and lighting as shown.
2. Complete system of raceways and outlets for Control and all other auxiliary systems of this Division 16. Unless noted otherwise, the equipment and wiring of these auxiliary systems will be furnished and installed under their respective sections; however, the conduit raceway systems will be furnished and installed under this Section 16400.
3. All excavating, backfilling, compacting, and grading required for the installation of all work covered under this Division 16.

B. Shall furnish and install all component parts of all the systems required for their safe and proper operation, whether or not specifically mentioned or noted on the drawings, except those items or articles which are specifically noted hereinafter as being supplied otherwise.

C. Perform all trenching and backfilling required in connection with the work of this section in strict accordance with the provisions of Division 02000 of these specifications.

D. Provide all required electrical connections and service to items described in all other sections of these specifications. Provide all those services outlined in other divisions of the specifications as being done by the electrical sub-contractor.

16400.1.4 RELATED WORK SPECIFIED ELSEWHERE:

Section 16010 – Electrical General Requirements
Section 16410 – Fuses

16400.2 PRODUCTS

16400.2.1 DISTRIBUTION PANELBOARDS

A. Distribution panelboards shall be factory assembled dead front, wall mounted as scheduled and braced for the indicated ampere rms symmetrical with equipment, bussing connections, circuit breakers and all similar components indicated on the drawings or required for proper completion. Each breaker shall have an etched micarta nameplate secured by two cadmium plated screws. Nameplates shall indicate equipment served as shown in schedule. Busses shall be copper of a maximum current density of 1000 amperes per inch and shall be equipped with uninsulated equipment ground bus. Three phase, 4-wire panels shall have full capacity neutral bus.

B. All floor mounted panels shall be mounted on a **4" housekeeping pad** and therefore to comply with NEC, the operating handles of switches and breakers shall be no more than 6'-2" above the bottom of the panel.

C. Distribution panel boards shall be wall mounted as indicated in schedules. For access to wiring gutters, panel shall be door within door construction. Shall be Square D, I-Line or equal of Siemens I.T.E., Cutler Hammer/Westinghouse or General Electric.

16400.2.2 BRANCH CIRCUIT PANELBOARDS

A. Branch circuit panelboards shall be Square D for the scheduled voltage, 3 phase, 4 wire operation or equal of Siemens, or General Electric. Shall be equipped with bolt-on breakers. Minimum width shall be 20 inches. Minimum depth shall be 5.75 inches. Panel trims shall be of the door within door construction.

B. Busses shall be copper.

C. Branch circuit breakers shall be provided per schedules on drawings. All multi-pole breakers shall be common trip.

D. Doors shall be complete with corrected circuit schedule on inside. Panels shall be NEMA 3R type construction.

16400.2.3 DRY TYPE TRANSFORMERS

A. General Purpose Dry-Type Transformers: (Under 600 volts)

1. General: Furnish and install at locations shown on the drawings dry-type two winding power transformers for general power and lighting applications indicated. Transformers shall be UL listed and bear the required Listing Mark.
2. Electrical Rating: Shall be 60 hertz of sizes, phases, high voltage and low voltage as scheduled on the drawings. Each transformer, unless specifically noted otherwise, shall have six (6) 2-1/2% full capacity taps, two above and four below nominal voltage in the high voltage winding.Temperature Classification: Each transformer shall utilize an insulation system that has been properly temperature classified and approved by Underwriters' Laboratories. Unless specifically noted otherwise, the insulation classification shall be 220 C with 150 C winding temperature rise in accordance with Underwriters' Laboratories specification UL506.

3. Load Rating:

   a. Each transformer supplied to this specification shall be capable of operating at 100% of nameplate rating (NPR) continuously while in an ambient temperature not exceeding 40°C and shall be capable of meeting the daily overload requirements of ANSI Standard C57.96 as stated in the following chart:

PERMISSIBLE ONCE DAILY OVERLOADS WITH NORMAL LIFE MAINTAINED			
Peak Load Following and Followed by a Constant Load of			
Peak Load Time (Hours)	90% NPR	70% NPR	50% NPR
1/2	162% NPR	185% NPR	200% NPR
1	138% NPR	148% NPR	152% NPR
2	123% NPR	128% NPR	133% NPR
4	113% NPR	115% NPR	118% NPR
8	106% NPR	107% NPR	108% NPR
NPR = Nameplate Rating			

   b. Transformer loaded in accordance with this paragraph shall be capable of long service life under the thermal conditions specified. There shall be no need for derating.

4. Sound Rating: Each transformer shall have sound levels equal or lower than those established in the latest revision of ANSI Standard C89 as shown in the following chart:

Transformer Rating KVA	Maximum Sound Level Decibels
10-50	45
51-150	50
150-300	55

5. Other Requirements: The following requirements shall be in accordance with Underwriters' Laboratories specification UL506:
   a. Enclosure:
      (i) Ventilation openings
      (ii) Corrosion resistance
      (iii) Cable bending space
      (iv) Grounding provisions
      (v) Surface temperature rise
      (vi) Wiring compartment temperature rise
      (vii) Terminations

6. Test Requirements:
   a. Each transformer furnished to this specification shall be subjected to the following production tests:
      (i) Applied potential
      (ii) Induced potential
      (iii) No load losses
      (iv) Voltage ratio
      (v) Polarity
      (vi) Continuity
   b. The manufacturer shall have performed the following additional tests on units identical to the design type being furnished to this specification. Proof of performance of these lists in the form of test data sheets shall be provided as part of the shop drawing submittal.
      (i) Sound levels
      (ii) Temperature rise tests
      (iii) Full-load losses
      (iv) Regulation
      (v) Impedance

7. Shop Drawings: Submit shop drawing for review prior to delivery to job site.

16400.3 EXECUTION

16400.3.1 INSTALLATION OF GROUNDING SYSTEM

A. The conduit system and neutral conductor of the wiring system shall be grounded to the cold water pipe having a continuous path to earth in compliance with grounding provisions as outlined in the NEC. Point of connection to the water system shall be as near as practicable to the service entrance. Provide bonding jumper same size as system ground to provide ground continuity from customer's side of metallic lines service entrance and street side of metallic mains. The neutral and ground shall be connected together at the main service switch only.

B. Where the water main is not metallic, delete water pipe ground requirements and provide a concrete encased electrode consisting of a 20-foot length of #3/0 bare copper conductor tied to the steel reinforcing bars and encased within a concrete footing. This footing shall be in direct contact with earth and located near the main panel.

C. The Contractor shall also install a made electrode ground system consisting of copperclad rods spaced not closer than six feet apart. Grounding conductors and connections to ground rods shall be protected from damage and shall be placed to avoid disconnect by unauthorized personnel. Interconnect with water pipe ground system.

D. The equipment grounding system shall be such that all metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, portable equipment and other conductive items in close proximity with the electrical circuits operate continuously at ground potential and provide a low impedance path for the possible ground fault currents. The system shall comply with the National Electrical Code, modified as indicated on the drawings or specifications and as hereinafter specified to incorporate a maximum 25 ohms ground resistance. Grounding connections shall be accessible for inspection.

E. The distributions system shall be provided with a separate equipment grounding conductor for each single or three-phase feeder, each branch circuit with a multi-pole protective device and each single phase receptacle and motor circuit as indicated. The required grounding conductor shall be installed in the common raceway with the related phase and/or neutral conductors. Single-phase branch circuits required for lighting, shall consist of phase and neutral conductors installed in common metallic conduit which shall serve as the grounding conductor. Conduit equipment connections utilized in conjunction with the above single-phase branch circuits shall be provided with suitable bonding jumpers connected to approved grounding type bushings. Single-phase branch circuits and all branch circuits installed in flexible conduits shall be provided with a separate grounding conductors as hereinbefore specified for the multi-pole branch circuits.

16400.3.2 INSTALLATION OF PANELS

A. Installation: Unless otherwise indicated on the drawings, install wall panels with the top of the trim 6'-0" above the finished floor. Panels located in equipment rooms and wire closets shall be surface mounted. Floor mounted panels shall be provided with a 4" concrete housekeeping pad. Floor mounted panels shall be anchored to floor at all four corners and to wall or structural member at top for seismic restraint.

B. Directories: Mount a typewritten directory behind glass or plastic on the inside of each panel door. On the directory, show the circuit number and complete description of all outlets with specific locations on each circuit. In addition, provide a typewritten label inside door showing source of power to panel both as to feeder switch, panel designation and location within buildings.

16400.3.3 GENERAL PURPOSE DRY TYPE TRANSFORMERS

General purpose dry transformers shall be mounted on floor at locations shown on drawings. Each shall be anchored to floor by means of a minimum of four 1/2" x 6" anchor bolts grouted in existing concrete floor.

16400.3.4 TESTING

A. General: Upon completion of this portion of the work, test all parts of the electrical system in the presence of the Engineer Owner's Representative.

B. Test Requirements: All systems shall test free from short circuits and grounds, shall be free from mechanical and electrical defects, and shall show an insulation resistance between phase conductors and ground of not less than that required by the National Electrical Code.

16400.3.5 FINAL INSPECTION

A. This Division 16 contractor's job foreman shall be present at the final inspection of the work by the Owner.

B. Electrical job foreman shall have pad and pencil to list all deficient items noted. Corrections and adjustments of deficient items shall be done after the inspection, not during.

C. See Section 16010 for other requirements for final inspection.

16400.4 METHOD OF MEASUREMENT

16400.4.1 SERVICE ENTRANCE. Provide all conduit, sweeps, support members, concrete transformer pads & pad vaults, grounding equipment, breakers, disconnects, enclosures, conductors, and appurtenances as required by the local utility, and as shown on the drawings and as defined in the applicable sections of the specifications required for a complete and fully functioning system.

16400.4.2 GROUNDING SYSTEM. Provide all grounding conductors, connections, ground rods, ground wells, and associated appurtenances and as shown on the drawings, and as defined in the applicable sections of the specifications.

16400.4.3 POWER PANEL (PP) OR MOTOR CONTROL CENTER (MCC). Provide all conduit, sweeps, pull boxes, power panels, motor starters, motor savers, receiving and installation of motor control center, transient voltage surge suppressor (TVSS), support members, grounding equipment, breakers, disconnects, enclosures, conductors and connections, and appurtenances as shown on the drawings and as defined in the applicable sections of the specifications required for a complete and functioning system.

16400.4.4 DRY TYPE TRANSFORMERS. Provide dry type transformer and appurtenances as shown on the drawings and as defined in the applicable sections of the specifications required for a complete and functioning system.

16400.4.5 LIGHTING PANEL (LP). Provide all conduit, sweeps, support members, grounding equipment, breakers, disconnects, enclosures, conductors and connections, switches, receptacles, and appurtenances as shown on the drawings and as defined in the applicable sections the specifications required for a complete and functioning system. Where lighting fixtures are not called out in the pay item, they are included in the LIGHTING PANEL (LP).

16400.4.6 LIGHTING FIXTURES. Material cost for lighting fixtures and all appurtenances. Note: conduit, wire and switches and included in LIGHTING PANEL (LP) section(s).

16400.4.7 HEATING VENTILLATION AIR CONDITIONING (HVAC). Provide all conduit, sweeps, support members, grounding equipment, breakers, disconnects, enclosures, conductors, switches, receptacles, and appurtenances as shown on the drawings and as defined in the applicable sections the specifications required for a complete and functioning system. Note: conduit, wire and switches and included in LIGHTING PANEL (LP) section(s).

16400.4.8 CONTROL PANELS. Provide all conduit, signal and power conductors and connections, and appurtenances for all control panels as shown on the drawings and as defined in the applicable sections of the specifications required to provide a complete and functioning system.

16400.5 BASIS OF PAYMENT

16400.5.1 No separate payment shall be made for furnishing or installing electrical systems, components, or materials required to be installed within the pay limits for a building or enclosure identified in the BID schedule to be furnished by the Contractor.

16400.5.2 When electrical systems, components, or materials are measured for a new building or enclosure as shown on the Bid Schedule, separate payment will be made as listed below.

16400.5.3 When initial installation or replacement of electrical systems, components, or materials is made in an existing building as shown on the Bid Schedule, the accepted quantity will be paid for at the contract price listed below:

PAY ITEM	UNIT
Service Entrance	Lump Sum
Grounding System	Lump Sum
Lighting Panel LP1 & Control Panel	Lump Sum
Lighting Fixtures	Lump Sum
HVAC	Lump Sum
Control Panels	Lump Sum

16410.1 GENERAL

16410.1.1 ACCEPTABLE MANUFACTURERS

A. Manufacturer: Bussmann.

B. Other acceptable manufacturer: Gould Shawmut, Littlefuse.

C. All fuses shall be of one manufacturer. Fuses shall have a 200,000 ampere RMS symmetrical interrupting rating unless noted otherwise.

16410.1.2 FUSE TYPES AND RATINGS

A. Fuses from 0 to 600 ampere for each circuit serving a single motor shall be UL Class RK5 dual-element Low Peak, LPN-RK (250 volt).

B. All other fuses in the 0 to 600 ampere range shall be UL Class J, dual-element, time delay, low peak, LPJ-SP (250 volt).

C. Fuses larger than 600 ampere shall be UL Class L with time delay, Hi Cap, KRP-C.

16410.2 METHOD OF MEASUREMENT

16410.2.1 This work shall not be measured for separate payment, but shall be considered incidental to other items in the Bid Schedule.

16410.3 BASIS OF PAYMENT

16410.3.1 Complete compensation for the accepted work outlined in this Section shall be included in other bid items.

BIKE PARK AND TRAIL PERFORMANCE SPECIFICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
    a. Singletrack trail performance standards.
    b. Bike park features.
    c. Asphalt pump tracks.
    d. Trail builder qualifying standards.

B. Related Sections include the following:
    a. Division 1 Section "Health and Safety" for requirements.
    b. Division 31 Section "Earth Moving" for preparation of subgrade, dewatering, geotextile fabrics, compaction of subgrade and subbase.
    c. Division 32 Section "Asphalt Paving" for bituminous paving materials utilized for pump track surfacing.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.
B. Product Schedule: For bike park features. Use same designations indicated on Drawings.
C. Maintenance Data: For bike park features to include in maintenance manuals.
D. References and Examples of Relevant Work: For natural surface singletrack trail builder, "tot track" builder, and asphalt pump track builder.
E. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
    1. Classification according to ASTM D 2487 of proposed tread surface material.
    2. Laboratory compaction curve according to ASTM D 1557 for proposed tread surface material.

1.4 DEFINITIONS

A. IMBA: International Mountain Biking Association.
B. WNYMBA: Western New York Mountain Biking Association.
C. Base Material: Granular soil and stone material serving as base support for singletrack tread material and allowing for effective percolation.
D. Limit of Disturbance: A boundary defined in the Contract Documents that depicts the limit of anticipated grading and earthwork and clearly identifies the extent of required clean fill

environmental cover. Boundary shall be flagged by the Contractor utilizing a licensed surveyor and maintained by the Contractor throughout the duration of the Work.

E. Rock Garden: A section of trail where the trail tread material is replaced with rock of various sizes throughout the entire trail width. The length rock gardens vary depending on trail grade and desired trail ability level. Rock gardens can be created by using rounded cobble or rough edged rubble.
F. Rugosity: A measure of small-scale variations of amplitude in the height of a surface. In trail construction context; measureable ruggedness, height difference from high to low transitions of individual rocks. The more rugged, higher rugosity, creates a more difficult rock garden to traverse. Measured in vertical inches of surface variation.
G. Singletrack: A narrow trail (typically natural surface) that users must generally travel in single file. It contrasts with doubletrack, which is wide enough for four-wheeled vehicles.
H. Singletrack Trail Builder: Skilled professional who understands how the nuances of singletrack trail flow and drainage measures create an exceptional trail/ride experience.
I. Skills Loop: A relatively short trail loop, typically located near a trailhead, that introduces novice riders to low risk, rideable, trail surface textures and features that will be found along progressively more advanced segments of trails at the adjacent trail network.
J. Skills Features: Pre-fabricated or on-site constructed, ride-able, features that progressively add challenge and/or difficulty to a trail or bike park component. Skills features can be installed in-line with a trail centerline or as an option (alt line) the predominate trail flow.
K. Pump Track: A type of bike park feature or designated area consisting of a circuit of banked turns, rollers, and features designed to be ridden completely by riders "pumping" - creating momentum by up and down body movements. Pump track surfaces can consist of natural soil, asphalt, or concrete; the latter of which allow for other users with smaller wheels such as skateboards, roller blades, and scooters.
L. Pump Track Installer: Skilled professional who understands how the nuances of pump track flow and drainage measures create an exceptional pump track experience.
M. Tot Track: Similar to a pump track, berms and rollers are sized appropriately for young riders on 2"-16" wheel bikes like Striders™ and balance bikes.
N. Tread Surface Material: Clean, imported soil with clay content suitable for compaction to create a stable, well-drained surface that will support mountain biking activity.

1.5 REFERENCES

A. Bike Parks: IMBA's Guide to New School Trails, (IMBA)
B. Trail Solutions: IMBA's Guide to Building Sweet Singletrack, (IMBA)
C. Managing Mountain Biking: IMBA's Guide to Providing Great Riding, (IMBA)
D. Trail Construction and Maintenance Notebook, (US Forest Service)

1.6 QUALITY ASSURANCE

A. Performance Specifications: All trail construction shall comply with the specifications, drawings, requirements and design intent prescribed in the Construction Drawings and Contract Documents.
    a. Completed trails and pump tracks shall reflect professional workmanship in appearance, quality, and attention to detail. Trails and features shall be well integrated into site, aesthetically pleasing in appearance, and well-shaped, crafted, and finished according to commonly accepted best practices for high quality and sustainable mountain biking trails. Work must be completed to the satisfaction of the Owner.
    b. Should the Trail Builder/Pump Track Installer discover discrepancies in the specifications, the matter shall be at once brought to the attention of the Owner's Representative, and the discrepancies corrected before proceeding further.
    c. Trail Builder/Pump Track Installer shall be responsible for any coordination with General Contractor and subcontractors as required to complete all operations.
    d. Test Riding: Trail Builder/Pump Track Installer shall thoroughly test ride all trails and trail features, by bike with appropriate expert rider, to ensure the specified riding experience, design, flow, rhythm, character, difficulty, and specifications are met. Testing shall be performed during the trail alignment and trail feature location process, as well as during construction and following construction, to the extent possible and in consultation with Owner. Trails and features shall be modified and corrected as necessary until performance specifications are met.
    e. Trail Builder/Pump Track Installer shall leave trails and the adjacent area in a finished and natural-looking condition and minimize disturbance to permanent existing vegetation to the extent possible in coordination with general Contractor, topsoil spreading, and irrigation and landscape installation.
    f. All excavated material generated during trail construction must be used in the trail, or dispersed and blended into surrounding terrain, or removed. No piles of excavated material greater than 6 inches depth shall be left behind.
    g. The Trail Builder/Pump Track Installer shall be responsible for fine grading and positive drainage away from all trails and trail features. Neither impoundments nor ponding of surface water shall be allowed.
    h. Where necessary, Trail Builder/Pump Track Installer may construct shallow porous detention basins adjacent to the trail to manage surface water drainage, provided they are constructed in an appropriate manner and do not create a hazard.
B. Bike Park and Trail Builder Qualifications: The City of Mapleton has issued separate qualifications for potential trail builders. Trail builders must qualify to bid on this project.

PART 2 - PRODUCTS

A. Source Limitations: Obtain each type of bike park feature through one source from a single manufacturer.
    a. Features made of natural materials such as wood and stone, as well as found materials, are an exception to the above.
    b. Acceptable manufacturers:
        i. Burly Built Co., Pittsburgh, PA. Phone: 614.592.0119. www.burlybuiltco.com
B. Shop Drawings/Layout Plans: Pump track installer shall submit to-scale plans and details of proposed pump track layouts, indicating all materials and features and associated installation details.
    a. Include plans, elevations, sections, and details of features and their transition to tread surface. Show anchorage and accessory items.
    b. Show anticipated drainage and proposed structure locations.
C. Mockups: Build mockups to verify construction of bike park features to demonstrate aesthetic effects, skill level of features, rugosity, and set quality standards for construction and installation.
    a. Build mockups for each type of feature, including adequate tread surface material leading up to and away from feature so as to permit trial riding by Owner and design professional.
    b. Upon completion of mockups, Installer shall notify the design professional and Owner to request an inspection. Notification must be given at least (7) days in advance of intended inspection.
        i. Installer shall make any and all modifications necessary to achieve an approved mockup at no additional cost to Owner.
    c. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Landscape Architect specifically approves such deviations in writing.
    d. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 3 - EXECUTION

3.1 - Installation + Equipment

A. Preconstruction Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
B. The Trail Builder/Pump Track Installer shall perform the required work using hand tools and/or small mechanized equipment that is a maximum of 50" in width. Equipment with adjustable width tracks must be able to reduce track width to less than 50".
C. All mechanized equipment shall be in good mechanical condition, free of any fluid leaks, be equipped with spark arrestors if applicable, and have charged fire extinguishers mounted in an accessible location. A spill kit will be maintained on site with all heavy

equipment. All equipment will be clean and free of debris before being introduced to the work site. Tracks, undercarriage, and digging implements shall all be free of soil that may contain non-native plant material. Equipment is subject to inspection at the start and during the project.

D. Any equipment that appears to not meet these criteria shall be removed from the project site at the request of the Client and at no additional cost to the Client.
E. The Trail Builder/Pump Track Installer shall provide the necessary supervision, equipment, and tools to perform specified trail maintenance and trail construction on identified trails and sites, including fuel for any mechanized equipment or tools and any and all personal protection and safety equipment required.

3.2 FINAL CLEAN-UP

Remove all debris, rubbish, and excess material from the work area.

END OF SECTION

MAPLETON
UTAH

32 38 10

BIKE PARK CONTRACTOR QUALIFICATIONS

PART 1 GENERAL

A. The City of Mapleton, Utah, is currently developing plans for a new park at Corner of Linden and Harmony Ridge. The park includes bicycle-specific trails and park elements, including downhill trails, jump lines, skill-building loops and asphalt pump tracks.

B. Due to the specialized nature of trail and bicycle park construction, it is in the best interest of the City to pre-qualify contractor(s) with extensive experience field-designing and constructing these facilities. The following are minimum qualifications for bidding contractors, additional experience and strong portfolios of built work may be presented.

C. Bidder's shall submit with their bid packet all required references, portfolios, example projects, or other documentation as listed in Part 2 Qualifications.

PART 2 QUALIFICATIONS

2.1 TRAILS

TRAIL CONTRACTOR MUST:

A. Be an established contractor, having at least five (5) years of experience in natural surface trail construction designed for hiking and biking with a demonstrable focus on bicycle optimized and directional flow trail construction.

B. Clearly demonstrate, in writing or by submitting a portfolio, that the contractor is experienced and knowledgeable in the construction of sustainable 24-60" wide natural surface (native soil) trails.

C. Provide at least five (5) project examples that are similar in size, scope and character (24 - 60" wide natural surface native soil trails optimized for downhill bicycle users).

D. Provide at least three (3) references for comparable projects completed in the last five (5) years, including contact person, phone number and email.

E. Be an active member of the Professional Trail Builders Association (PTBA).

F. Provide a list and description of capabilities and experience of any subcontractors that may be used to construct the trails.

G. Provide a list of equipment owned or rented for trail construction.

H. Provide active Utah contractors license & Utah Business Entity Number.

2.2 JUMP LINES AND SKILLS AREAS

JUMP LINE AND SKILLS AREA CONTRACTOR MUST:

A. Be an established contractor, having at least five (5) years of experience in the construction of purpose built bike parks.

B. Clearly demonstrate, in writing or by submitting a portfolio, that the contractor is experienced and knowledgeable in the construction of public/municipal bike parks that include progressive jump lines and progressive skills areas which integrate pre-fabricated and field built structures with steel or wooden framework and wooden riding surfaces (or comparable alternative materials).

C. Provide at least five (5) project examples that are similar in size, scope and character to the progressive jump lines and skills area in this solicitation.

D. Provide at least three (3) references for comparable projects completed in the last five (5) years, including contact person, phone number and email.

E. Be an active member of the Professional Trail Builders Association (PTBA).

F. Provide a list and description of capabilities and experience of any subcontractors that may be used to construct the included bike park elements.

G. Provide a list of equipment owned or rented for jump line and skill area construction.

H. Provide active Utah contractors license & Utah Business Entity Number.

2.3 PUMP TRACKS

PUMP TRACK CONTRACTOR MUST:

A. Be an established contractor, having at least five (5) years of experience in the construction of asphalt paved bicycle pump tracks for all skill levels.

B. Clearly demonstrate, in writing or by submitting a portfolio, that the contractor is experienced and knowledgeable in the final design and construction of modern, progressive, sustainable asphalt pump tracks for riders of various skill levels.

C. Provide at least five (5) project examples that are similar in size, scope and character to the pump tracks included in this solicitation, including final design and construction.

D. Provide at least three (3) references for comparable projects completed in the last five (5) years, including contact person, phone number and email.

E. Be an active member of the Professional Trail Builders Association (PTBA).

F. Provide a list and description of capabilities and experience of any subcontractors that may be used to construct the asphalt pump tracks.

G. Provide a list of equipment owned or rented for pump track construction.

H. Provide active Utah contractors license & Utah Business Entity Number.

2.4 ADAPTIVE MOUNTAIN BIKING (AMTB)

ALL CONTRACTORS WISHING TO SUBMIT A BID FOR THE CONSTRUCTION OF THE MAPLETON BIKE PARK MUST:

A. Clearly demonstrate intimate familiarity with aMTB trail design standards (Kootenay Adaptive Sport Association or similar).

B. Provide at least three (3) project examples that demonstrate compliance with aMTB trail design standards for the following (Provide a minimum of 3 projects total):

1. Downhill-optimized or Multi-Use natural surface trails
2. Skill development areas
3. Asphalt pump tracks

2.5 WORKLOAD AND STAFFING

ALL CONTRACTORS WISHING TO SUBMIT A BID FOR THE CONSTRUCTION OF THE MAPLETON BIKE PARK MUST:

A. Provide their projected build forecast for the 2026 build season.

B. Provide a hierarchy chart of the proposed build crew(s) for this project, including the roles of each employee (Site supervisor, operator, hand crew, etc.) anticipated to construct this project, and the employee's experience working on similar projects.

C. Certify that the contractor is able to complete construction according to the project schedule (anticipated construction April-September 2026).

END OF DOCUMENT

ASPHALT MIX FOR BIKE AND PEDESTRIAN PATHS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Products and procedures for constructing a surface course of one or more layers of asphalt mix comprised of aggregate, asphalt binder, lime, and other additives for bike and pedestrian paths.
B. Mix materials at a central mixing plant.

1.2 RELATED SECTIONS

A. Section 02741: Asphalt Mix
B. Section 02745: Asphalt Material
C. Section 02746: Hydrated Lime
D. Section 02748: Prime Coat/Tack Coat

*Note: This is a UDOT standard specification.

1.3 REFERENCES

A. AASHTO T 11: Materials Finer Than 75 µm (No. 200) Sieve In Mineral Aggregates By Washing
B. AASHTO T 19: Bulk Density (Unit Weight) and Voids in Aggregate
C. AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates
D. AASHTO T 30: Mechanical Analysis of Extracted Aggregate
E. AASHTO T 89: Determining the Liquid Limit of Soils
F. AASHTO T 90: Determining the Plastic Limit and Plasticity Index of Soils
G. AASHTO T 96: Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine
H. AASHTO T 104: Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
I. AASHTO T 112: Clay Lumps and Friable Particles in Aggregate
J. AASHTO T 176: Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
K. AASHTO T 209: Theoretical Maximum Specific Gravity and Density of Asphalt Mixtures
L. AASHTO T 304: Uncompacted Void Content of Fine Aggregate
M. AASHTO T 308: Determining the Asphalt Binder Content of Asphalt Mixtures by the Ignition Method
N. AASHTO T 335: Determining the Percentage of Fracture in Coarse Aggregate
O. UDOT Materials Manual of Instruction (MOI)

1.4 DEFINITIONS Not Used

1.5 SUBMITTALS

A. Mix design for verification and approval before paving according to UDOT Materials Manual of Instruction Section 960.
B. Certify, for information, that the mix meets the gradation requirements of Table 2 and that the asphalt binder requirements from the Job Mix Design. Refer to AASHTO T 30 and T 308.

PART 2 PRODUCTS

2.1 ASPHALT MATERIALS

A. Use the following asphalt materials:
    a. Asphalt Binder – Performance Graded (PG) Binder.
    b. Flush Coat – CQS-1, CSS-1 or SS-1.

2.2 AGGREGATE

A. Refer to Section 02745 and Section 02741 excluding Aggregate Properties Table.
B. Use Table 1 following for Aggregate Properties.

Table 1

Aggregate Properties		
Properties	**Test Method**	**Test Requirements**
One Fractured Face	AASHTO T 335	N/A
Two Fractured Face	AASHTO T 335	90% Min.
Fine Aggregate Angularity	AASHTO T 304	45 Min.
Flakiness Index	MOI 933 Based on ⅜” + above	17% Max.
L.A. Wear	AASHTO T 96	35% Max.
Sand Equivalent	AASHTO T 176, alternate method 2, pre-wet method (test the sample in the wet condition).	45 Min.
Plasticity Index	AASHTO T 89 and T 90	0
Unit Weight	AASHTO T 19	75 lb/ft3 Min.

Soundness Loss	AASHTO T 104 – Sodium Sulfate	16% Max. loss with five cycles
Deleterious Materials	AASHTO T 112	2% Max.
Natural Fines	- - -	10% Max.

C. Meet gradation in Table 2.

Table 2

Aggregate Gradations Percent Passing by Dry Weight of Aggregate AASHTO T11 and AASHTO T27	
Control Sieve	**Percent**
1⁄2 inch	100.0
3⁄8 inch	90.0 - 100.0
# 4	< 90.0
# 8	32.0 - 67.0
#200	2.0 - 10.0

2.3 HYDRATED LIME

A. Use at least one percent hydrated lime.
B. Refer to Section 02746.

2.4 BASE MATERIAL

A. Base material for pump tracks shall consist of a locally sourced ¾” minus road base.
B. Road base to be compacted in lifts with a maximum thickness of 12”.
C. Base material shall be compacted to minimum 95% utilizing a standard ASTM D1557 Proctor test.
    a. During placement of base material, one compaction test shall be performed per lift (12”).
    b. Results of compaction testing shall be maintained and furnished to owner upon request.

2.5 VOLUMETRIC DESIGN REQUIREMENTS

A. Perform Superpave Volumetric Mix Design according to UDOT MaterialsManual of Instruction 960 and the following:
    a. Incorporate hydrated lime into all designs. Refer to Section 02746.
    b. Comply with Table 3.
B. The Department verifies the Volumetric Mix Design. Refer to UDOT Materials Manual of Instruction 960.
    a. The Department may approve the Volumetric Mix Design from data submitted with the proposed mix design or from a previous mix design.
    b. The Department reserves the right to verify any mix design submitted.

Table 3

Superpave Volumetric Mix Design		
Compaction Stage	**Number of Gyrations (N)**	**% of Gmm (AASHTO T 209)**
Initial	5	≤ 91.5
Design	50	≥ 98.5
Maximum	75	≤ 100.0

PART 3 EXECUTION

3.1 ASPHALT MIX
A. Refer to Section 02741, Part 3.

3.2 SURFACE PREPARATION
A. Refer to Section 02741, Part 3.
B. Refer to Section 02748.

3.3 COMPACTION
A. Establish a rolling pattern to obtain maximum density without over-stressing the pavement.

3.4 ASPHALT EMULSION
A. Apply the flush coat at a uniform rate of 0.10 gal/yd2 undiluted emulsion or 0.15 gal/yd2 2:1 diluted emulsion.
    a. Diluted emulsion 2:1 represents two parts undiluted emulsion and one part water.

END OF SECTION

SECTION 323100 - SITE IMPROVEMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The General Documents, as listed on the Table of Contents, and applicable parts of Division 1, General Requirements, will be included in and made a part of this Section.

B. Examine all Contract Documents and all other Sections of the Specifications for requirements therein affecting the work of this trade.

1.2 SUMMARY

A. The work of this Section consists of providing all labor, equipment, materials, coordinating with owner's vendor (for owner provided materials), incidental work, and construction methods necessary to furnish and install designated Site Improvements and related items as indicated on the Contract Documents, as specified in this Section, and includes, but is not limited to, the following:

1. Park Structures (Pavilions and Storage/Maintenance Building)
2. Site Furnishings (picnic table, benches, bike racks, etc.)
3. Shade Sails
4. Decorative Pavers and Colored Concrete
5. Boulder Retaining Walls
6. Landscape Boulders
7. Park Entry Signage
8. Misc. Signage

B. Contractor shall furnish and install all other incidental items and accessories necessary to complete the Site Improvements as shown and specified, whether specifically mentioned or not

1.3 RELATED WORK UNDER OTHER SECTIONS

A. Related work specified and included in other Sections of the Specifications:

1. Section 312000 - Earthwork
2. Section 321313 – Concrete
3. Section 329119 – Fine Grading and Soil Preparation

1.4 REFERENCES

A. The following standards will apply to the work of this Section:

1. American Society for Testing and Materials (ASTM).
   a. ASTM A-53/A53M-01 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
   d. ASTM E 228-95 Standard Test Method for Linear Thermal Expansion of Solid Materials With a Vitreous Silica Dilatometer.
2. TT-C-490C, Methods I and III.
3. AWS standard D1.1.

1.5 SUBMITTALS

A. Furnish for approval all Manufacturers' specifications for all items listed in this Section

B. Shop Drawings: The contractor shall submit Shop Drawings where noted for review and acceptance prior to product fabrication or delivery to the site. Shop Drawings shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials, color, and similar data to enable an adequate review of the information required.

C. Color Samples: Provide physical color samples for all hardware.

D. Samples for Verification: For each of the following:

1. Landscape Boulders –sample of landscape boulder identifying source, including name and telephone number of supplier. Samples shall demonstrate representative colors, size, and overall form.

2. Stone Dust – sample of stone dust/gravel identifying source, including name and telephone number of supplier. Samples shall demonstrate representative colors, size, and overfall form.

3. Aliphatic Binder – sample of Aliphatic Binder identifying source, including name and telephone number of supplier. Samples shall demonstrate representative colors, size, and overfall form.

4. Fencing – sample of fence material identifying source, including name and telephone number of supplier. Samples shall demonstrate representative colors, size, and overfall form.

5. Stone Veneer – sample of stone veneer for columns identifying source, including name and telephone number of supplier. Samples shall demonstrate representative colors, size, and overfall form.

E. Sample Panels and Mockups

1. Job mock-up: Prior to installation of boulder walls, erect sample wall mock-ups in accordance with section 329000 Planting and Landscape Work for boulder walls.
2. Obtain Landscape Architect's and Owner's Authorized Representative's acceptance of the visual qualities of the mock-up before the start of any remaining boulder wall construction.
3. Mock-ups may remain in place as part of finished construction once approved.

1.6 SUBSTITUTIONS

A. Any proposed product substitutions shall be in accordance with the General Conditions; shall meet or exceed the specified warranty; shall be equivalent in specific features and qualities such as performance, weight, size, durability, visual effect; shall be compatible with the rest of the work; and **shall not require any changes or revisions to the Construction Documents**.

1.7 QUALITY ASSURANCE AND STANDARDS

A. Workmanship and finish will be equal to the best practice of modern shops for each item of work.

B. Inspect all components for correct fabrication and compliance with Specifications.

1.8 DELIVERIES, STORAGE, AND HANDLING

A. Store delivered Site Improvement items under this Section in a manner to prevent wracking or stress of components, and to prevent mechanical damage or damage by the elements.

B. Protect all stored materials and items from weather, careless handling and vandalism.

C. Items, which become rusted or damaged because of non-compliance with these conditions, will be rejected and will be replaced without additional cost to the Owner.

1.9 GENERAL INSTALLATION

A. Configure or secure exposed anchors, bolts or fasteners in such a way as to prevent their casual removal by use of vandal-proof heads or fastenings unless otherwise specified on Drawings.

B. Provision, delivery and installation of all materials, except as otherwise specified under other Sections of this Specification, will be in accordance with and paid for under the work of this Division 32 Section, Site Improvements.

C. Unless specifically called out in the Contract Documents, galvanized steel or cast iron sections to be joined will not be welded after galvanizing but will be mechanically attached by means of unexposed sleeves and fasteners sufficient to provide secure attachment under normal usage.

D. Set freestanding site improvement items plumb vertically and horizontally, regardless of the pitch of the finished surrounding grade unless otherwise shown on the Contract Documents.

E. The Contractor will be responsible for timing the delivery of site improvement items to minimize the on-site storage time prior to installation.

F. Protect all stored materials from weather, careless handling, and vandalism.

G. Contractor will be responsible for the correct location of site improvement items. Take particular care to maintain shapes, plumb and level during the pouring of concrete.

H. All Work will be accurately set to established lines and elevations and rigidly set in place to supporting construction.

1.10 COORDINATION

A. The Work of this Division 32 Section, Site Improvements, will be completely coordinated with the work of other Sections. Verify dimensions and work of other trades that adjoin materials of this Section before installing items specified.

B. Contractor shall work with the City and necessary equipment representatives to coordinate delivery of all Owner Provided Materials in a timely manner as necessary to keep construction on schedule.

1.11 GUARANTEE

A. The Contractor will furnish and deliver standard written manufacturer's guarantee in Owner's name covering all materials and workmanship under this Division 32 Section, Site Improvements, in addition to, and not in lieu of, guarantee requirements set forth under Division 1, General Requirements, and other liabilities which the Contractor may have by law or other provisions of the Contract Documents.

B. Pay for repairs of any damage to any part of the project, or caused by defects in his work and for any repair to the materials or equipment caused by replacement. Complete all repairs to the satisfaction of the Owner's Representative.

C. Replace any part of the work installed under this contract requiring excessive maintenance. Work of this nature will be considered defective. Replace at no cost to the Owner upon notification during the one-year guarantee period.

PART 2 PRODUCTS

2.1 CONTRACTOR PROVIDED & CONTRACTOR INSTALLED SITE IMPROVEMENTS

A. Colored Concrete: as specified in the products and materials schedule and in locations as shown on the drawings. Provide as detailed and in accordance with specification Section 321313.

B. Stone Dust/Gravel: as specified in the products and materials schedule and in locations as shown on the drawings.

C. Fencing: as specified in the products and materials schedule and in locations as shown on the drawings.

D. Park Monument Sign: Park Entrance Gateway. Detailed Drawings to be provided by Contractor.

E. Stone Veneer Columns: as specified in the products and materials schedule and in locations as shown on the drawings.

2.2 OWNER PURCHASED, CONTRACTOR INSTALLED

A. The following items will be owner-purchased and contractor-installed. The contractor is fully responsible for all coordination with the manufacturer, including confirming shop drawings, scheduling delivery to the site, receiving and inspecting materials upon delivery, and notifying the manufacturer of any missing or damaged components. The Contractor shall store, protect, and install these structures in accordance with the drawings, specifications, and manufacturer requirements. The Contractor shall serve as the primary point of contact with the manufacturer for all communication, scheduling, and warranty coordination related to these items. The owner's role is limited to purchasing the structures only.

For owner-purchased items that include vendor-provided installation (such as the Playground Area including equipment and surfacing), the Contractor shall coordinate, schedule, and integrate the vendor’s work into the overall construction sequence as if the vendor were a subcontractor. The Contractor shall be responsible for site access, sequencing, safety coordination, and ensuring the vendor’s work is properly integrated with all other trades.

B. Pavilion Structures and Storage/Maintenance Building: Contractor shall coordinate delivery with Vendor/Owner to allow proper time for construction sequencing to keep the project on schedule. Contractor will be responsible for grading work, footings, installation and erection of Pavilion Structures and Storage/Maintenance Building, concrete pad, electrical and lighting work.

C. Decorative Pavers: Contractor shall coordinate delivery with Vendor/Owner to allow proper time for construction sequencing to keep the project on schedule.

D. Shade Sails: Contractor shall coordinate delivery with Vendor/Owner to allow proper time for construction sequencing to keep the project on schedule. Contractor will be responsible for

grading work, footings, installation and erection of Pavilion Structures and Storage/Maintenance Building, concrete pad, electrical and lighting work.

E. Site Furnishings: Contractor shall coordinate delivery with Vendor/Owner to allow for proper time for constructions sequencing to keep the project on schedule. Contractor will be responsible for grading work, concrete, and installation of all Site Furnishings.

F. Boulder Retaining Walls and Landscape Boulders: Contractor shall coordinate delivery with Vendor/Owner to allow for proper time for constructions sequencing to keep the project on schedule. Contractor will be responsible for grading work and final placement of landscape boulders.

G. Park & Misc. Signage: Contractor shall coordinate delivery with Vendor/Owner to allow proper time for construction sequencing to keep the project on schedule. Contractor will be responsible for grading work, footings, installation and erection all signage on the Site.

2.3 EARTHWORK MATERIALS

A. All backfill materials, including base and sub-base materials, ordinary borrow, drainage fill and structural fill will be as specified under the Division 31 Section, Earthwork, of this Specification, and provided, delivered and paid for under the work of this Division 32 Section, Site Improvements.

PART 3 EXECUTION

3.1 EARTHWORK

A. All excavation, filling, compacting and grading of backfill materials, including base and sub base materials, ordinary borrow, drainage fill and structural associated with and used in the installation of the items of this Division 32 Section, Site Improvements, will be as specified under the Division 31 Section, Earthwork, and performed and paid for under the work of this Division 32 Section, Site Improvements.

Excavation and concrete work specifically provided by YESCO for the Entry Sign is excluded from this requirement.

3.2 CONCRETE

A. Concrete footing placement, protection, and formwork will be as specified under the Division 32 Section Site Concrete, of this Specification and installed and paid for under the work of this Division 32 Section, Site Improvements. Concrete footings will be to the sizes noted on the Contract Documents.

3.3 CONTRACTOR PROVIDED & CONTRACTOR INSTALLED EQUIPMENT/IMPROVEMENTS INSTALLATION

A. Colored Concrete: Contractor to install as detailed and in locations shown on the drawings and specifications Section 321313 and current APWA standards.

B. Stone Dust/Gravel: Contractor to install as detailed and in locations shown on the drawings.

C. Fencing: Contractor to install as details and in locations shown on the drawings.

D. Park Entrance Gateway: Contractor to provide detailed design and drawings to Owner and Design Team for review and approval, including structural and electrical engineering and design, as required. Contractor will be responsible for grading work, footings, installation and erection of Park Entrance Gateway.

E. Stone Veneer Columns: Contractor to install as detailed and in locations shown on the drawings.

3.4 OWNER PURCHASED, CONTRACTOR INSTALLED

A. Pavilion Structures and Storage/Maintenance Building: Contractor to install Pavilion Structures and Storage/Maintenance Building, as detailed and in accordance with the Manufacturer's drawings, details, and installation instructions.

1. Contractor shall be responsible for grading work, concrete pad, concrete footings, and utility work associated with the Pavilion Structures and Storage/Maintenance Building, in addition to erecting and installing the structures.

2. Coordinate structure footings with electrical work for electrical conduits at post footings. Electrical to run within the pavilion and trellis structures with **NO** exposed conduit.

H. Decorative Pavers: Contractor to install pavers as detailed and in locations shown on the drawings, and per supplier's recommendations.

I. Site Furnishings: Contractor to install all furnishings as detailed and in locations shown on the drawings, and per manufacturer's instructions.

J. Boulder Retaining Walls and Landscape Boulders: Contractor to install retaining walls and boulders as detailed at locations shown on the drawings.

K. Shade Sails: Contractor to install shade sails as detailed and in locations shown on the drawings, and per the manufacturer's instructions.

L. Park & Misc. Signage: Contractor to install all park signage as detailed and in locations shown on the drawings.

END OF SECTION 323100

SECTION 328400 - IRRIGATION SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes piping, valves, sprinklers, specialties, controls, and wiring for automatic-control irrigation system.

1.3 WORK TO BE DONE

A. Work to be done includes furnishing all labor, materials, equipment and services required to complete all irrigation work indicated on the Drawings, as specified herein, or both. The work to be performed under this Section shall consist of furnishing all labor and materials necessary to construct a complete working and tested irrigation system as per all drawings and specifications, providing full head-to-head coverage on all lawns and planting areas on the site. Included also will be maintenance and warranties. Work shall also include coordinating with supplier and Weber State University for commissioning, programing, and training by the manufacturer's certified service representative.

B. The Contractor shall perform, but not be limited to, all of the following functions: Paying all connection fees, deposits and all other charges related to the connection to the water source. Obtain all permits, complete all excavation, backfill, provide backflow device, tapping saddle, yoke, stop and waste, corp. cock, concrete vaults and miscellaneous pipe fitting. Make necessary road repairs, provide safety barrier, and make connection to water source. All in compliance to applicable codes and requirements of the utility companies involved.

C. The electrical point of connection for the irrigation system shall be 120-volt electrical supply.

D. The Drawings and Specifications must be interpreted and are intended to complement each other. The Contractor shall furnish and install all parts, which may be required by the Drawings and omitted by the Specifications, or vice versa, just as though required by both. Should there appear to be discrepancies or questions of intent, the Contractor shall refer the matter to the Owner's Representative for decision, and his interpretation shall be final, conclusive, and binding.

E. All necessary changes to the Drawings to avoid any obstacles shall be made by the Contractor with the approval of the Owner's Representative.

F. Trench excavation, back filling, and bedding materials, together with the testing of the completed installation shall be included in this work.

G. The work shall be constructed and finished in every respect in a good, workmanlike, and substantial manner, to the full intent and meaning of the Drawings and Specifications. All parts necessary for the proper and complete execution of the work, whether the same may have been specifically mentioned or not, or indicated on the Drawings, shall be done or furnished in a manner corresponding with the rest of the work as if the same were specifically herein described.

H. Record Drawings as well as Operating & Maintenance Manual generation, in accordance to these specifications shall also be included in this work.

I. If electrical service is not already in place, the Contractor will be required to make all necessary arrangements with the Power Company including, but not limited to, paying fees, making power connections, providing poles, weatherhead and meter, etc., as specified on the plans. All permits, fees, and compliance with electrical company requirements, shall be the Contractor's responsibility.

1.4 SCOPE

A. The irrigation system shown on the Drawings and described within these Specifications represents an automatic controller irrigation system. The system is designed for a **minimum operating pressure at the irrigation mainline point of connection and maximum flow demand as noted on the drawings. The irrigation contractor shall verify water pressure prior to construction and report any differences to Owner's Representative**.

1.5 RELATED WORK UNDER OTHER SECTIONS

A. Carefully examine all of the Contract Documents for requirements that affect the Work of this Section.

1.6 ORDINANCES, PERMITS AND FEES

A. The Work under this Section shall comply with all ordinances and regulations of authorities having jurisdiction.

B. The Contractor shall obtain and pay for any and all permits, tests and certifications required for the execution of Work under this Section.

C. Furnish copies of Permits, Certifications and Approval Notices to the Owner's Representative prior to requesting payment.

D. Call Blue Stakes to verify location of existing utilities prior to commencement of work.

1.7 EXAMINATION OF CONDITIONS

A. The Contractor shall fully inform himself of existing conditions on the site before submitting his bid, and shall be fully responsible for carrying out all work required to fully and properly execute the work of the Contract, regardless of the conditions encountered in the actual Work. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed, except those conditions described in the General Conditions.

B. Investigate and determine available water supply pressure and flow characteristics.

1.8 QUALITY ASSURANCE

A. Installer: A firm that has at least five (5) years' experience in work of the type and size required by this Section and which is acceptable to the Owner's Representative.

B. References: The Contractor must supply three references for work of this type and size with their bid including names and phone numbers of contact person(s).

C. Applicable requirements of accepted Standards and Codes shall apply to the Work of this Section and shall be so labeled or listed:
   1. American Society for Testing & Materials (ASTM)
   2. National Plumbing Code (NPC)
   3. National Electric Code (NEC)
   4. National Sanitary Foundation (NSF)
   5. American Society of Agricultural Engineers (ASAE)
   6. Underwriters Laboratories, Inc. (UL)
   7. Occupational Safety and Health Regulations (OSHA)

1.9 TESTS

A. Observation: The Owner's Representative will be on site at various times to ensure the system is being installed according to the Specifications and Drawings.

B. Operational Test: After completion of the system, test the operation of entire system as directed by the Owner's Representative. Demonstrate to the Owner's Representative that all irrigated areas are being adequately covered (See Part 3 - Execution). Any deficiencies identified at this time will require revisions and adjusting by the Contractor at the Contractor's expense. Any deficient irrigation head will be adjusted for proper coverage and set to proper depth at this time.

C. Inspections will be required for:
   1. Hydrostatic test of irrigation main line – 150 psi for not less than 2 hours.
   2. All piping system layout before backfilling.
   3. Coverage test.
   4. Final inspection / Start of Maintenance.

D. Inspection Requests: Contractor shall notify the Project Manager a minimum of 48 hours (two working days) in advance for all inspections.

1.10 SUBMITTALS

A. Refer to 010000 General Requirements for additional submittal requirements.

B. Submittals shall be submitted for approval in **Electronic PDF format.**

C. List of Materials: Submit for approval **Electronic PDF** copies of the complete list of materials proposed for use. Quantities of materials and equipment need not be included. No deviations from the specification shall be allowed, except as provided for in these documents.

D. Product Data: Submit manufacturer's technical product data and installation instructions for all irrigation system materials and products to be installed to the Owner's Authorized Representative for approval prior to the start of work. Work on the irrigation system may not commence until product data submittal is received and approved. Submittals shall be marked up to show proper sizes, flows, etc.

E. Record Irrigation Drawings: The Contractor shall maintain complete Record Drawings showing all deviations from the contract documents made during construction affecting the sleeves, main line pipe, controller locations, isolation valves, remote control valves, quick coupler locations, and other equipment indicated on the drawings. All wire routing, wire size, and splices shall be indicated. These Record Drawings shall be kept on a clean set of prints of the contract documents and will be reviewed by the Owner's representative throughout construction to verify that changes are being recorded. Main line pipe and wire route shall have two (2) distinctly different graphic symbols (line types). These record drawings shall be submitted to the Owner's representative before the time of

the Systems Inspection/Substantial Completion Inspection. The Substantial Completion Certificate Date will not be issued until the Owner's representative receives the Record Irrigation Drawings.

F. Maintenance Data and Operating Instructions: Submit (1) three ring, hard cover binder and one PDF(Electronic File) titled MAINTENANCE AND OPERATING INSTRUCTIONS FOR THE [Project Name] to the Owner's representatives office prior to application for acceptance and final payment. After review and approval, the copies will be forwarded to the Owner. Included in the Maintenance and Operating Manual shall be:
   1. Table of Contents
   2. Written description of Central Control System.
   3. System drawings:
      a. One (1) copy of the original plan.
      b. One (1) copy of the Record Drawing.
   4. Listing of Manufacturers.
   5. Manufacturers' data where multiple model, type and size listings are included, clearly and conspicuously indicating those that are pertinent to this installation.
      a. "APPROVED" submittals of all irrigation equipment.
      b. Instructions of Operation
      c. Maintenance: including complete troubleshooting charts.
      d. Parts list.
      e. Names, addresses and telephone numbers of recommended repair and service companies.
   6. Winterization and spring start-up procedures.
   7. Guarantee data.

G. Control Zone map: Upon completion of system, place in each controller, a color-coded copy of the area that controller services; indicating zone number, type of plant material and location on project that zone services. Laminate map with heat shrink clear plastic. **Copy of Control Zone Map shall also be included in Operation and Maintenance Manual.**

H. Controller Wiring Map: Each separate run of two-wire control wiring is to be a different color wire or marked with colored tape at all splices. The color of each separate two-wire run shall be indicated on the Control Wiring Map. The contractor shall also record amperage (mA) of each two-wire run from the farthest point on each run back to the controller and note amperage reading on the Controller Wiring Map. Controller Wiring Map shall be laminated with heat shrink clear plastic and placed in the controller(s). **Copy of Controller Wiring Map shall also be included in Operation and Maintenance Manual.**

1.11 DELIVERY, STORAGE AND HANDLING

A. Store and handle all materials in compliance with manufacturer instructions and recommendations. Protect from all possible damage. Minimize on-site storage.

1.12 GUARANTEE

A. The Contractor shall obtain in the Owner's name the standard written manufacturer's guarantee of all materials furnished under this Section where such guarantees are offered in the manufacturer's published product data. All these guarantees shall be in addition to, and not in lieu of, other liabilities that the Contractor may have by law.

B. In addition to the manufacturer's guarantees the Contractor shall warrant the entire irrigation system, both parts and labor for a period of one (1) year from the date of acceptance by the Owner.

C. As part of the one-year warranty the Contractor shall perform the first year-end winterization and spring start-up for the irrigation system in the presence of the Owner's designated maintenance personnel. The Contractor shall operate, maintain until acceptance, and guarantee the new system until all lawn and plants planted on this project have become established and have been approved by the Owner's Representative.

D. The Contractor shall correct any deficiencies when notified during the guarantee period, and additionally correct, to the satisfaction of the Owner, any damage to buildings or grounds caused by deficient work at no cost to the Owner.

E. All guarantees shall be in writing and submitted to the Owner's representative for review and approval on or before the date of Substantial Completion.

1.13 SUBSTANTIAL COMPLETION

A. The date of Substantial Completion for the irrigation system will be when the Maintenance and Operating Manual has been approved, the As-Built Record Drawings have been submitted, and the irrigation system is working as intended. This will be determined by observation by the Landscape Architect and Owner's Representative.

1.14 COORDINATION

A. The Contractor shall at all times coordinate his work closely with the Owner's Representative to avoid misunderstandings and to efficiently bring the project to completion. The Owner's Representative shall be notified as to the start of work, progression and completion, as well as any changes to the drawings before the change is made. The Contractor shall also coordinate his work with that of his sub-contractors.

B. The Contractor shall be held responsible for and shall pay for all damage to other work caused by his work, workmen or sub-contractors. Repairing of such damage shall be done by the Contractor who installed the work, as directed by the Owner's Representative.

1.15 MAINTENANCE AND OPERATING INSTRUCTIONS

A. Contractor shall include in their Bid an allowance for four (4) hours of instruction of Owner and/or Owner's personnel upon completion of check/test/start-up/adjust operations by a competent operator (The Owner's Representative shall be notified at least one (1) week in advance of check/-test/start-up/adjust operations).

1.16 PROCEDURE

A. Notify all city departments and/or public utility owners concerned, of the time and location of any work that may affect them. Cooperate and coordinate with them in the protection and/or repairs of any utilities.

B. Provide temporary support, adequate protection and maintenance of all structures, drains, sewers, and other obstructions encountered. Where grade or alignment is obstructed, the obstruction shall be permanently supported, relocated, removed or reconstructed as directed by the Owner's Representative.

C. SUBSTITUTION OF MATERIALS: Any proposed product substitutions shall be in accordance with the General Conditions; shall meet or exceed specified warranty; shall be equivalent in specific features and qualities such as performance, standard and optional operational features, operation,

size, and durability, shall be compatible with the rest of the work; and shall not require any changes or revisions to the Construction Documents.

D. SYSTEM PRESSURE The irrigation system is designed for a minimum static pressure as noted on the drawings unless otherwise specified and is schematic only, with the intent to convey full head-to-head coverage of the lawns and planting areas affected. The system must also provide the manufacturer's recommended minimum operating pressure or greater to every head while maintaining sufficient pressure to overcome the losses due to friction in the piping, fittings, and all other equipment.

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials to be incorporated in this system shall be new and without flaws or defects and of quality and performance as specified and meeting the requirements of the system. All material overages at the completion of the installation are the property of the Contractor and shall be removed from the site.

B. No material substitutions from the irrigation products described in these specifications and shown on the drawings shall be made without prior approval and acceptance from the Owner’s Representative. For the existing sprinkler irrigation system on the site, the Contractor shall remove any lines being abandoned, and cap or plug the ends of lines remaining in service with proper fittings and thrust blocks. The contractor shall remove or relocate existing heads and/or connect new lines to existing lines, as indicated on the plans.

C. Any existing head, valve, valve marker, valve box, or other existing equipment located where there will be a grade or surface material change, shall be adjusted up or down to its proper position in relation to the new finished grade, at no additional cost to the owner, unless the plans show it to be relocated.

2.2 PVC IRRIGATION PIPE

A. All Main Line Pipe 4” or larger shall be PVC Class 200 O-ring pipe conforming to ASTM D1785-83 and ASTM D-1684 with ratings printed on pipe.

B. All Main Line or Lateral Line Pipe 3” or smaller shall be Schedule 40 PVC plastic pipe ASTM D 1785 (see plans for sizes and locations) with ratings printed on pipe.

C. All main and lateral line pipe 2 ½” or smaller shall have PVC plastic socket fittings ASTM D 2464 & 2467.

D. Flex swing pipe shall be THICK-WALLED POLY PIPE as manufactured by TORO or RAIN BIRD. This pipe is to be used only between spray heads and lateral lines and shall not exceed a distance of 2 ft. and shall only be used on heads of 7 GPM or less.

2.3 IRRIGATION FITTINGS

A. Fittings for mainline pipe sizes 3” or larger shall be Harco or approved equal joint restraint or M.J.or equal fittings with transition gaskets at all changes of direction tees, ells, caps, etc. M.J. fittings to be greased, wrapped, and ‘megalugged’. An exception for automatic valves: Fitting transition from main line pipe may be Harco ductile iron fitting.

B. Fittings for pipe 2 ½"" or smaller shall be:
   1. PVC Mainlines – SCH 80 for all solvent weld fittings
   2. PVC Lateral Lines – SCH 40 for all solvent weld fittings
   3. Use Weld-on, IPS P-70 Primer and Weld-on IPS PVC 711 plastic pipe cement. Products are to be applied per manufacturer's specifications. All connections on main lines must be allowed to set for twenty-four hours prior to pressurization.

C. M.J. tees, SCH 80 S tees with SxT sch. 80 bushings are approved on PVC mainlines 2 ½" and smaller for automatic sprinkler valve installation.

D. All solvent weld fittings on PVC main lines and lateral lines shall be schedule 40 as manufactured by Dura, Lasco, Spears or equal, except as detailed at valve manifolds. Schedule 80 S tees with SXT schedule 80 bushings are approved on PVC main lines for automatic sprinkler valve installation.

E. All PVC threaded connections in and out of valves shall be made using Schedule 80 toe nipples and Schedule 40 couplers or socket fittings. Schedule 40 male threads will not be approved for installation.

F. All nipples and risers to be schedule 80 PVC.

G. Flex Swing Piping – Schedule 80 threaded 1/2" or 3/4" x "barbed insert" elbows.

H. Quick Coupler– Pre-assembled swing joints with brass threaded inserts as manufactured by Spears or Dura.

I. All solvent welded joints shall be made with IPS Weld-on-Line, P-70 Primer and No. 711 cement.

J. Lateral lines shall be connected by either solvent welded or threaded connections. Use IPS Weld-on-Line, P-70 Primer and No. 711 cement for solvent welded connections and Teflon tape for threaded connections.

K. No Galvanized fittings shall be allowed on any PVC lines or fittings.

2.4 SLEEVES

A. Sleeves shall be installed for all irrigation pipe and wire under non-soil areas and where indicated on the Drawings. Sleeve size shall be twice the nominal size of the pipe, and a minimum of 4 inches. PVC Sch. 40 water pipe shall be used except where noted.

2.5 WIRE CONDUIT

A. Conduit for wiring to controllers shall be schedule 80 PVC, size as indicated on chart.

Number of Wires	Minimum Conduit Size
1-7	1"
8-11	1 1/2"
12-22	2"
23-31	2 1/2"
32-36	3"

B. Two-Wire Control Wire: Conduit for two-wire path, master valve wiring, or communication cable shall be 1" HDPE 100 PSI Poly Pipe. Install a standard size valve box as a 'Pull Box' at minimum of every 150'.

2.6 STOP AND WASTE VALVES

A. Stop and Waste type valves shall be solid bronze meeting Federal Specification WW-V-54, CLASS A, Type 1. Size shall be the same as the mainline of the sprinkler system which it is installed on. This valve must be installed at the same depth as the water source, the stop and waste will be installed in a curb box as herein specified. Valve shall be key operated, and of Meuller and/or Ford Type Valves.

2.7 BACKFLOW PREVENTERS

A. Provide Backflow Preventer as specified on the drawings.

2.8 BACKFLOW PREVENTER ENCLOSURES

A. Backflow Enclosure shall be a Strong Box Stainless Steel Enclosure, or approved equal with locking kit, and Insulated Blanket. Enclosure shall be sized to fit specified backflow preventer assembly as detailed and meeting all state and local codes.

2.9 FILTERS

A. Filter shall be as specified on the drawings.

B. Filter enclosure shall be as indicated on the drawings and details.

2.10 DUAL WATER SOURCE PHYSICAL DISCONNECT ASSEMBLY

A. Provide Physical Disconnect Assembly as detailed on the drawings.

2.11 HYDROMETERS, FLOW SENSORS, AND MASTER VALVES

A. All Hydrometers, Master Valves and Flow Sensors shall be of the size and type as specified on the drawings and installed as detailed and in accordance with manufacturer's installation instructions. Unless otherwise indicated on the drawings, hydrometers, master valves, and flow sensors shall be installed in their own separate valve box.

2.12 ELECTRONIC CONTROL VALVES

A. All electric remote control valves shall be of the size and type as specified on the Drawings.

2.13 DRIP CONTROL VALVE ASSEMBLIES

A. All drip control valve assemblies shall include valve, filter and pressure regulator. Size and type as specified on the Drawings.

2.14 VALVE BOXES

A. Valve boxes for control valves shall be rectangular valve box with bolt down cover as manufactured by Carson or approved equal. Valve boxes shall be sized to provide ample room for access and repair. No valve box shall rest directly upon the valve or any fixture associated with it. Each valve box shall be centered on the valve it covers. Each valve box shall have 6 inches of pea gravel placed in the bottom underneath the valve and lines to reduce the potential of mud and standing water therein.

B. Valve boxes for quick coupling valves, isolation valves, and manual drain valves shall be 10” round valve box as manufactured by Rainbird or approved equal.

C. Valve box extensions shall be provided as required for proper box depth.

D. Valve boxes and lids shall be **green** in all lawn areas and **tan** to match the mulch specified in all plant beds. The contractor shall verify availability from suppliers and state the color used in the submittals. It is the contractor’s responsibility to order custom colors well in advance.

E. Valve box for electric control valves, isolation valve, hydrometers, and quick coupling valves shall be a rectangular valve box and bolt down cover as manufactured by Rainbird, or approved equal and shall be of size required to fit all necessary equipment while allowing adequate space for servicing of equipment.

F. Valve boxes for approved wire splices, drain valves, resilient wedge isolation valves, shall be 10” round valve box as manufactured by Rainbird, or approved equal.

G. Valve box extensions shall be provided as required for proper box depth.

2.15 AUTOMATIC CONTROLLER

A. Automatic Controller and enclosure as specified on the drawings

2.16 WIRE

A. Standard Control Wire: All valve control and common wire shall be minimum #14 single strand, solid copper, 600v, direct burial PE insulated type cable, and shall meet all state and local codes for this service. Individual wires must be used for each zone valve. Common wire shall be white in color, control wire shall be red in color, and spare wires, installed where indicated on the drawings shall be blue. White color shall be used for common wire only.

B. In ground wire connections shall be UL listed, manufactured by 3M, model DBY-6 splice kits. All wire splices shall be made in valve boxes, at controller, or at valves.

C. Wire type and method of installation shall be in accordance with local codes for NEC Class II circuits of 30-volt A.C. or less.

D. Splices in electric control wires shall be soldered first and then fitted with a 3M DBY Direct Bury Splice Kit. No exceptions**.** All splices shall be contained in a valve box.

E. Provide two spare control wires along each leg or section of mainline from the valve(s) farthest from controller(s) back to the associated controller. Loop spare control wires back through each valve box back to the controller(s).

2.17 TWO-WIRE CONTROLLER WIRE

A. Shall be as indicated in the Supplemental Two Wire Notes included on the drawings and shall be run from the controller to each decoder.

B. All two-wire cable to be installed in 1" HDPE conduit. In areas where two-wire conduit span between valve boxes is greater than 150, Contractor shall install standard size valve box as conduit pull box every 150' and install extra cable length as noted.

C. For trouble shooting purposes, a star configuration is to be used as opposed to a looped configuration.

D. An electric decoder cable fuse devise (DCFD) to be installed at all splits in the 2-wire path where more than two runs of Maxi Cable come together. Install DCFD and extra cable in standard size valve box.

E. Each two-wire branch is to be either a different color of wire, or marked with colored tape at all splices for troubleshooting purposes and recorded on the Controller Wiring Map.

F. An extra 36" of cable shall be installed on both the incoming and outgoing runs of two-wire cable at each control valve to allow maintenance personnel to lift control valves out of box for maintenance and servicing.

G. 36" of extra cable length to be installed at all splices and conduit pull boxes, and valve boxes.

H. Contractor shall clearly indicate on As-Builts and Controller Wiring Map the two-wire path routing, with each color of wire, and record the amperage of each two-wire run from the farthest point on each run back to the controller on the As-Builts and Controller Wiring Map.

2.18 TWO WIRE DECODERS

A. Two-Wire Decoders shall be as indicated in the Supplemental Two Wire Notes included on the drawings. Only one decoder to one valve shall be used with no exceptions.

B. Contractor to install decoders as per manufacturer's installation instructions. New decoder to be numbered in sequence with current system.

C. Decoders are to be pre-addressed from the manufacturer.

2.19 LINE SURGE PROTECTION ALONG TWO-WIRE PATH

A. Two-wire surge protection shall be provided in accordance with manufacturer's installation instructions and requirements and as indicated in the Supplementary Two Wire notes on the drawings.

B. Grounding is to be installed at each line surge protection installed as per decoder grounding details and shall meet manufacturer's minimum grounding requirements as necessary to maintain product warranty. All grounding shall allow for 10 OHMS of resistance or less.

2.20 COMMUNICATION CABLE – Not Required. Flow sensors are to be connected via senor decoder.

2.21 ISOLATION VALVES

A. Mainline Isolation Valves shall be resilient Wedge Gate Valves - conforming to AWWA specification C 509. They shall be of Class 200 cast iron body. Resilient-seated Gate Valve and shall have a non-rising stem with rubber "0" rings and square operating nut. Stems shall be of cold rolled, solid bronze, high tensile strength. Valve shall be high strength cast iron, fully encapsulated urethane rubber wedge. Gate valves shall be hydrostatically pressure tested for 400 P.S.I. and shall be designated for a working pressure of 200 P.S.I. Valve shall be American made.

B. Control Valve Manifold Isolation Valves
1. Isolation Valve shall be a gate valve or ball valve as detailed on the drawings and as specified.
2. Gate Valves: Milwaukee brand or approved American made brass gate valve with non-rising stem. Size shall be the same size as the main line on which it is installed.
3. Ball Valves: shall be solid bronze meeting Federal Specification WW-V-54, CLASS A, TYPE. Size shall be the same size as the main line on which it is installed.
4. Manifold Isolation Valve shall be installed on the up-stream side of the electric remote control valve, as detailed. Install one (1) isolation valve per control valve cluster. For control valve clusters larger than three (3), provide one (1) isolation valve per three (3) control valves.

2.22 QUICK COUPLER

A. Quick coupling valves shall be as specified on the drawings.

2.23 MANUAL DRAIN VALVES

A. All drain valves shall be 3/4" Mueller &/or Ford ball type and installed as per details on the drawings. Drain valves are to be installed on mainlines only.

B. The location of each manual drain shall be shown on the "as built" drawing with dimensions from the nearest permanent fixture, such as a building corner, etc....

C. Each manual drain valve will be accessed by a 2-inch P.V.C. Schedule 40 pipe sleeve, capped by a Weathermatic 906L locking valve cap with a RLK-1 key, no approved equals, enclosed within a 10" round Brooks Bolt down box - top of drain sleeve to be 3" - 6" below lids of Brooks Box.

D. Each manual drain shall empty into a gravel sump, a minimum of 18 inches by 18 inches by 12 inches deep. The gravel shall be washed 3/4-inch rock. No pea gravel will be allowed.

2.24 CRUSHED STONE

A. Crushed stone shall be as specified on the Drawings. Crushed stone shall be used under valve boxes.

2.25 IRRIGATION HEADS

A. Pop-up spray and rotors as specified on the drawings.

2.26 PREFABRICATED SWING JOINTS

A. Prefabricated swing joint with brass threaded inserts shall be as manufactured by Spears or Dura.

2.27 DRIP TUBING AND COMPONENTS

A. Drip Tubing & Fittings: Drip tubing shall be as specified on the Drawings and Details.

B. Drip Emitters: Shall be as specified on the drawngs and details.

C. Line Flushing Valves: shall be as specified on drawings.

D. Drip Indicators: Shall be as specified on drawings.

2.28 THRUST BLOCKS AND JOINT RESTRAINTS

A. Provide joint restraints as per manufacturer's installation requirements and as detailed wherever the main line pipe:
1. Changes any direction at tees, angles, and crosses vertical and horizontal.
2. Changes size at reducers.
3. Stops at a dead-end.
4. Valves at which thrust develops when closed.
5. Thrust blocks are only acceptable at Backflow Preventer Assembly, as detailed.

B. The size and type of thrust block depends on pressure, pipe size, kind of soil, and type of fitting. As a general rule, one cubic foot (minimum) of class AA(AE) Type II concrete is required for each thrust block.

C. Thrust blocks shall rest against undisturbed original earth in the direction of thrust.

D. Upward Thrusts at Fittings: Where a fitting is used to make a vertical bend, use a bar to anchor the fitting to a thrust block braced against undisturbed soil. The thrust block should have enough resistance to withstand upward and outward thrusts at the fitting.

PART 3 - EXECUTION

3.1 GENERAL

A. Examine all contract documents applying to this Section noting any discrepancies and bringing the same to the attention of the Owner's Representative for timely resolution.

B. Make all field measurements necessary for the work noting the relationship of the irrigation work to the other trades. Coordinate with other trades (landscaping and other site work trades). Project shall be laid out essentially as indicated on the Irrigation Plans, making minor adjustments for variations in the planting arrangement. Major changes shall be reviewed with the Owner's Representative prior to proceeding.

C. Irrigation component locations are shown on the drawings diagrammatically. It shall be the contractor's responsibility to determine the exact location of each valve and quick coupler to accommodate the conditions as found on the site. Avoid installing valves in areas where curbs and sidewalks come together or at any intersection of two or more walkways. All deviations from the drawings will be noted on the "As-Built" drawings.

D. At all times, protect existing irrigation, landscaping, paving, structures, walls, footings, etc. from damage. Any inadvertent damage to the work of another trade shall be reported at once.

E. The points of reference shall be the existing walks, buildings, and curbs. The staking shall be approved by the Owner's Representative prior to commencing installation operations. Any changes in the system which appear necessary, due to field conditions, must be called to the attention of the Owner's Representative and approved at the time.

F. Excavation work shall be as deep and as wide as will be required to safely perform the work, such as making mainline connections or forming vaults. Trenches shall be deep and wide enough to provide working space and to provide 18 to 30 inches of cover over the top of all pipe and fittings on main lines (lines which maintain a constant water pressure) and 12"-16" of cover over all lateral line piping. All trench bottoms shall be sloped so that the pipe will gravity drain back to the nearest manual drain. If the existing main line is deeper than 30 inches, the Contractor shall install a riser to a depth of 18 to 30 inches and then install the new line at the required 18-30" depth. At no time will the mainline be installed deeper than 30" unless prior approval by Owner's Representative. Each pipe laying in a mainline or lateral line trench shall not touch any other pipe. Maintain a pipe separation distance of 6" between each pipe.

G. Irrigation heads, valves and quick coupler locations are shown on the drawings diagrammatically. It shall be the contractor's responsibility to determine the exact location of each irrigation head, valve and quick coupler to accommodate the conditions as found on the site in order to provide complete head-to-head coverage of all areas. Avoid installing valves in areas where curbs and sidewalks come together or at any intersection of two or more walkways. Do NOT exceed the manufacturer's recommended spacing or as shown on the drawings for the irrigation heads. Minor adjustments in the system will be permitted to clear existing fixed obstructions subject to the approval of the Owner's Representative. All deviations from the drawings will be noted on the "As-Built" drawings.

H. All irrigation heads will be set perpendicular to the finished grade unless otherwise designated on the drawings and specifications.

I. POP-UP HEADS: Trenches for lines supplying pop-up heads shall be deep enough to maintain a minimum of 12-16 inches of cover over the top of all pipe and fittings. Trenches for these lines shall be a minimum of 6 inches away from any walks and curbs, and of sufficient width to accommodate tees coming out sideways (horizontally) from the laterals.

3.2 PIPE AND FITTINGS INSTALLATION

A. Using proper width trencher chain, excavate a straight and true trench to the depth required to provide specified cover over piping.

B. Loam encountered within the limits of trench excavation for irrigation mains and branch lines shall be carefully removed to the lines and depths as shown on the Drawings and stockpiled for subsequent replacement in the upper 6 inches of the trench from which it is excavated. Such removal and replacement of the quantities of loam shall be considered incidental to the irrigation system and no additional compensation will be allowed therefore.

C. Back filling shall be accomplished as follows: the first 10-inch of backfill material shall contain no foreign matter and no rock larger than 1 inch in diameter. Carefully place material around pipe and wire and tamp in place. Remainder of backfill shall be laid-up in 6-inch (maximum) lifts and tamped to compaction with mechanical equipment matching adjacent undisturbed area. Frozen material shall not be used for backfill.

D. All threaded fittings shall be installed using Teflon tape.

E. Make all solvent-weld joints in strict accordance with manufacturer's recommendations, making certain not to apply an excess of primer or solvent, and wiping off excess solvent from each connection. Allow connections to set minimum 24 hours before pulling or pressure is applied to the system. Provide for expansion and contraction as recommended. Wire shall be laid in same trench as mainline and at pipe invert (see Wire Installation). IPS 70 Primer and IPS 711 cement shall be used for all solvent welded pipe joints.

F. Mainline pipe shall have minimum 18 inches of cover (excavate as required by pipe size). Lateral pipe shall have minimum 12 inches of cover (excavate as required by pipe size).

G. Cut plastic pipe with handsaw or pipe-cutting tool, removing all burrs at cut ends. All pipe cuts are to be square and true. Bevel cut end as required to conform to Manufacturer's Specifications.

H. Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the trench. At times, when installation of the piping is not in progress, the open end(s) of the pipe shall be closed by a watertight plug or other means. All piping, which cannot temporarily be joined, shall be sealed to make as watertight as possible. This provision shall apply during the lunch hour as well as overnight. Pipe not to be installed that day shall not be laid out. Should water enter the trench during or after installation of the piping, no additional piping may be installed or back filled until all water is removed from the trench. Pipe shall not be installed when water is in the trench, when precipitation is occurring, or when the ambient temperature is at 35 degrees F or below. PVC pipe shall be snaked in the trench to accommodate for expansion and contraction due to changes in temperature.

3.3 ELECTRICAL WIRE CONDUIT INSTALLATION

A. Electrical conduit shall be installed through controller base as detailed. Conduit shall be sized appropriately to accommodate all irrigation control wires and power supply.

3.4 BACKFLOW PREVENTER INSTALLATION

A. Install specified backflow preventer as detailed and in compliance with state and local codes.

3.5 BACKFLOW PREVENTER ENCLOSURE INSTALLATION

A. Install enclosure and insulation blanket according to manufacturer’s installation instructions and in compliance with state and local codes.

3.6 MAINLINE FILTER AND FILTER ENCLOSURE

A. Install specified filter as detailed in specified enclosure in location shown on the plans. Exact location of filter assembly installation shall be approved by Landscape Architect and Owner’s Authorized Representative.

3.7 DUAL WATER SOURCE PHYSICAL DISCONNECT

A. Install physical disconnect as detailed in location shown on the plans.

3.8 HYDROMETERS, FLOW SENSORS, & MASTER VALVE INSTALLATION

A. Install Hydrometers, Master Valves, and Flow Sensors as detailed and in accordance with manufacturer installation recommendations. Unless otherwise indicated on the drawings, hydrometers, master valves, and flow sensors shall be installed in their own separate valve box. of size and type required to provide adequate space to work on and service the equipment. Flow Sensor and Master Valve location shall be approved by Owner.

3.9 PIPE SLEEVING INSTALLATION

A. Sleeving shall be installed wherever piping is going under a non-soil area, generally where indicated on the Drawings. Minimum cover over all sleeving pipe shall be the depth as necessary to match lines (18”-30” for mainlines and 12”-16” for lateral lines) as shown on the detail except where noted otherwise.

3.10 ISOLATION VALVE INSTALLATION

A. Install Mainline Isolation Valves as detailed in locations shown on the drawings.

B. Install one (1) manifold isolation valve on mainline before each valve cluster. For clusters larger than three (3) control valves install one (1) isolation manifold isolation valve for three (3) control valves. Install isolation valve on a level crushed stone base so that they can be easily opened or closed. Install specified valve box over isolation valve.

3.11 QUICK COUPLER VALVE INSTALLATION

A. Install Quick Coupler Valves as detailed and in the locations shown on the drawings.

3.12 VALVE BOX INSTALLATION

A. Furnish and install valve boxes as detailed for electric control valves, quick coupling valve, isolation valve, manual drain valves, and wire splices.

B. Valve access boxes shall be installed on a minimum 6-inch crushed stone base. Finish elevation of all boxes shall be at grade except where noted on the Drawings. A 2” clearance must be maintained between the base of the valve and the crushed stone base. All crushed stone shall be supplied by the Contractor and installed before valve box is installed. Crushed stone shall not be poured into previously installed valve boxes.

3.13 CONTROL VALVE AND DRIP CONTROL VALVE ASSEMBLY INSTALLATION

A. Install valve assemblies as detailed. Control valves shall be installed on a level crushed stone base. Grade of base shall be consistent throughout. Valves shall be set plumb with adjusting handle and all bolts, screws and wiring accessible through the valve box opening.

B. Adjust zone valve operation after installation using flow control device on valve.

C. Do not install valves in areas where curbs and sidewalk come together or at any intersection of two or more walkways.

3.14 ELECTRICAL CONTROL WIRE INSTALLATION

A. Standard Control wiring shall only be used for wiring of valve to decoder and wiring of master valve as specified. Wiring shall be installed in the same trench as the main line wherever possible.

B. Wire type and method of installation shall be in accordance with local codes for NEC Class II circuits of 30-volt A.C. or less.

C. All connections made inside the box to connect wires to the valve shall be made inside a 3M-DBR/Y connector. Each connector shall be completely sealed and waterproof with a minimum 24” wire loop.

D. All wires shall be direct runs with no splices. Wires cannot be spliced without approval of Owner’s representative or Project Manager.

E. Splices in electric control wires shall be fitted with a 3M DBR/Y Direct Bury Splice Kit. No exceptions. All splices shall be contained in a valve box with extra length equal to 24” above the top of the valve box.

F. Wire shall be pulled into controller with 12” minimum tail, and properly labeled. Any wire that comes from the ground to the controller must be housed in PVC conduit or flex conduit.

G. It is important that the splice is absolutely waterproof so that there is no chance for leakage of water and corrosion build-up on the connection. All wiring shall be accomplished with as few splices as possible. Splice locations shall be shown on the Record Drawings.

H. An expansion curl shall be provided within 6 inches of each wire connection to a solenoid and at least every 100 feet of wire length on runs more than 100 feet in length. Expansion curls can be formed by wrapping five (5) turns of wire around a 1-inch diameter or larger pipe and then withdrawing the pipe.

I. Contractor shall provide a complete wiring diagram showing wire routing for the connections between the controller and valves. See section one for the inclusion of wiring diagram in operation and maintenance manuals.

3.15 TWO-WIRE CONTROL WIRE INSTALLATION

A. Two-Wire Control Wire - shall be installed in the same trench as the main line wherever possible. All conduit shall be installed in trenches 6 inches to either side of the pipes so that the conduit is protected from damage during backfilling and maintenance operations. See detailed drawing showing the wire located in those positions. Conduit not placed in the trenches by the sides or under the pipes, shall be buried 18 inches or deeper and marked on the "as built" drawings.

B. All two-wire cable connections shall be made with watertight wire splice connectors as indicated in the Supplementary Two Wire Notes included on the drawings.

C. All connections made inside the box to connect wires to the valve shall be made inside a 3M-DBR/Y connector. Each connector shall be completely sealed and waterproof with a minimum 36” wire loop.

D. Two-wire conduit is to terminate inside valve box. Install a standard size valve box as a 'Pull Box' at minimum of every 150'.

E. Install all with a minimum 3 feet expansion loop for both incoming and outgoing wiring on two wire path for ease of maintenance.

3.16 DECODERS

A. Install decoders as per manufacturer's recommendations. Contractor to lay out decoders as required by system. No two valves are to share the same address. Appropriate sensor decoders shall be used for the flow sensor and master valves.

B. All two wire decoders shall be installed inside valve box of control valve(s) in accordance with all manufacturers' installation recommendations.

C. Grounding and line surge protection to be installed as per decoder grounding detail and per manufacturer's installation recommendations. Grounding wire shall be connected to grounding rods/plates with cadweld connection.

3.17 COMMUNICATION CABLE INSTALLATION

A. All communication cable shall be direct runs with no splices.

B. All connections or splices in communication cable shall be made with a 3M SLiC Connector.

3.18 CONTROLLER INSTALLATION

A. Contractor shall install controller(s) according to manufacturer's installation instructions and as detailed on Drawings. Locations of controller are to be as indicated on the drawings. Coordinate exact controller location with Owner's Authorized Representative. Contractor shall wire valves into controller and set proper program.

B. Controller requires 120-volt electrical supply.

3.19 IRRIGATION HEAD INSTALLATION

A. All irrigation heads will be set perpendicular to the finished grade unless otherwise designated on the drawings and specifications.

B. All pop-up spray heads shall be installed on Flex swing pipe with 1/2" spiral barbed ells and one street ell as detailed.

C. All pop-up rotor heads in turf areas or planting beds shall be installed on a pre-manufactured swing joint as detailed. All pop-up rotor heads in native seed areas shall be installed above ground on a schedule 80 riser as detailed. Above ground installations shall be staked as detailed.

3.20 DRIP TUBING AND COMPONENTS

A. Install emitters as detailed in locations shown on drawings and details.

B. Fittings: All connections shall be per details.

C. Line Flushing Valves: Install as detailed in locations shown on the drawings and as needed to allow proper flushing of all sections of inline emitter drip tubing.

D. Drip Indicators: Install as detailed in locations indicated on the drawings. Contractor to ensure drip indicators are placed in each planter and at the ends of the drip zone (farthest point away from the valve).

3.21 JOINT RESTRAINT INSTALLATION

A. Install ductile Iron Joint Restraints in accordance with manufacturer's installation instructions at each change of direction on all irrigation lines 3" or larger.

3.22 CHECK / TEST / START-UP / ADJUST

A. Before any pipes are covered, the Owner's Representative or a representative of the owner shall inspect the system for compliance with specifications and drawings. Any required changes will be made at this time at no expense to the owner.

B. Flushing: After all piping, and valves are in place and connected, flush piping under a full head of water.

C. Testing:
1. Leakage test: test all lines for leaks under operating pressure. Repair all leaks and re-test.
2. Coverage test: perform a coverage test in the presence of the Owner's Representative (notify Owner's Representative at least seven (7) days in advance of scheduled coverage test). Representative will determine if the water coverage is complete and adequate. Readjust heads and/or head locations as necessary or directed to achieve proper coverage.
3. All testing shall be at the expense of the Contractor.
4. Substantial completion will not be issued until all testing and required adjustments are completed.

3.23 CLEANING AND ADJUSTING

A. At the completion of the work, all parts of the installation shall be thoroughly cleaned. All equipment, pipe, valves and fittings shall be cleaned of grease, metal cuttings and sludge that may have accumulated by the operation of the system for testing.

B. Adjust valve boxes to grade as required.

C. Each control zone shall be operated for a minimum of 15 minutes and checked for consistency of delivering water. Valves, timing devices or other mechanical or electrical components, which fail to meet manufacture's standards, shall be rejected, replaced and tested until they meet the manufacturer's standards.

3.24 CONTROLLER AND CENTRAL CONTROL SYSTEM COMMISSIONING, PROGRAMMING, AND TRAINING

A. Contractor shall coordinate with irrigation controller suppliers and owner for controller and central control commissioning, programming, & training by the **controller manufacturer's certified service representative.** This commissioning, programming, & training **must be conducted by manufacturer's certified service provider (Sprinkler Supply Company, contact Brady Pitcher, 801.592.6490)** & shall include communication setup and verification, web interface setup and verification, weather data setup and verification, controller station value

recording/programming, flow sensing set up and testing, and controller/web interface training for owner's maintenance personnel.

B. Commissioning shall occur after installation is complete, wiring is terminated, and all components are operational and labeled.

C. Any reprogramming required due to contractor error or changes in field wiring shall be performed at the contractor's expense.

3.25 ACCEPTANCE AND OPERATION BY OWNER

A. Upon completion of the work and acceptance by the Owner, the Contractor shall be responsible for the training of the Owner's Representative(s) in the operation of the system (provide minimum 48 hours written notice in advance of test). The Contractor shall furnish, in addition to the Record Drawings and operational manuals, copies of all available specification sheets and catalog sheets to the Owner's personnel responsible for the operation of the irrigation system. The Contractor shall guarantee all parts and labor for a minimum period of one (1) year from date of acceptance.

B. During the one (1) year warranty period, it will be the responsibility of the Contractor to work with the designated IHC Maintenance personnel to drain and winterize the system in the fall. It will also be their responsibility to help activate system in the spring and make sure there are no problems.

3.26 GUARANTEE

A. All work shall be guaranteed for compliance with the drawings and specifications for a period of one year after the date of substantial completion. The contractor shall correct any deficiencies when notified during the warrantee period and correct in satisfactory condition any damage to the buildings or grounds, without cost to the owner. All guarantees shall be in writing and approved by the Owner's Representative before submitting to the owner.

B. AS-BUILT DRAWINGS shall be furnished to the Owner's Representative at the time of the Systems Inspection **before any Substantial Completion Date will be issued.**

3.27 CLEAN UP

A. Upon completion of all installation work, Contractor shall remove all leftover materials and equipment from the site in a safe and legal manner.

END OF SECTION

SECTION 329000 - EXTERIOR PLANTING AND LANDSCAPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
1. Trees
2. Shrubs
3. Ground cover
4. Plants
5. Bulbs
6. Mulch
7. Concrete Mow Curb

B. Related Sections include the following:

1. Section 321313 – Concrete Paving
2. Section 328400 – Irrigation
3. Section 329119 – Fine Grading and Soil Preparation
4. Section 329223 – Sodding
5. Section 321313 – Concrete Paving

1.3 DEFINITIONS

A. Balled and Burlapped Stock: Exterior plants dug with firm, natural balls of earth in which they are grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of tree or shrub required; wrapped, tied, rigidly supported, and drum-laced as recommended by ANSI Z60.1.

B. Balled and Potted Stock: Exterior plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of exterior plant required.

C. Container-Grown Stock: Healthy, vigorous, well-rooted exterior plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for kind, type, and size of exterior plant required.

D. Finish Grade: Elevation of finished surface of planting soil.

E. Planting Soil Mix: Soil produced by homogeneously blending existing on site or imported topsoil, organic compost, and Utelite fines as specified and mixed with necessary soil amendments as determined by required soil tests.

F. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

G. Substantial Completion: The point in time when the Work is sufficiently complete, in accordance with the Contract Documents, that the owner can occupy or use the Work for its intended purpose.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For each of the following:
1. Bark Mulch – 1 gallon zip lock bag minimum sample size of bark mulch, identifying source, including name and telephone number of supplier.
2. Crushed Stone– 1 gallon zip lock bag minimum sample size of crushed stone, identifying source, including name and telephone number of supplier.
3. Weed Control Fabric: 18” x18” sample identifying source, including name and telephone number of supplier. Provide product specification information with sample.
4. Landscape Boulders – Provide sample of landscape boulder identifying source, including name and telephone number of supplier.

C. Product Certificates: For each type of manufactured product, signed by product manufacturer, and complying with the following:
1. Manufacturer's certified analysis for standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

D. Qualification Data: For landscape installer.

E. Planting Schedule: Prepare a proposed planting schedule. Schedule the dates for each type of landscape work during the normal seasons for such work in the area of the site. Correlate work with specified maintenance periods to provide maintenance throughout the specified time period. Once accepted, revise dates only as approved in writing, after documentation of reasons for delays.

F. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of exterior plants during a calendar year. Submit before the expiration of required maintenance periods.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer with a minimum of 5 years of experience whose work has resulted in the successful establishment of exterior plants.
1. Installer's Field Supervision: Require the Installer to maintain an experienced full-time supervisor on Project site when exterior planting is in progress.
2. Qualification of Arborist: All work of pruning shall be performed by an arborist certified by the International Society of Arboriculture.

B. All plants shall comply with Federal and State Laws requiring inspection for plant disease and infestations. Any inspection certificates required by law shall accompany each delivery of plants, and such certificates shall be filed with the Owner’s Authorized Representative.

C. All Plants shall conform to the size, age, and condition as specified in the plant list shown on the drawings. Undersized plant material will not be approved. No additional compensation shall be due the contractor if larger than specified plant material is provided.

D. In all cases, the contractor shall be held responsible for all plant materials indicated on the plans unless otherwise directed in writing by the Landscape Architect.

E. Each bidder shall investigate sources of supply and satisfy himself that he can supply all of the plants mentioned in the planting lists in size, variety, and quantity noted and specified before his bid is submitted. Failure to take this precaution will not relieve the successful bidder from his responsibility as contractor to furnish and install all plant material in strict accordance with the contract requirements without additional expense to the owner.

F. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."

G. Tree and Shrub Measurements: Measure according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches above ground for trees up to 4-inch caliper size, and 12 inches above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.

H. Representative Plant photographs: The contractor shall provide actual photographs (one photograph minimum per plant species, variety, and/or cultivar), obtained from the plant source for each plant listed in the plant schedule to show representative standards of quality and compliance with the contract requirements. Plants shall be photographed with a person or some type of measuring device included in the photo to provide scale. Approval of the photographed plant materials does not constitute final acceptance. Plant material will be observed and inspected at the job site.

I. Plant Observation: After approval of plant photographs, Landscape Architect shall observe trees and shrubs, and other plant material at job site for compliance with requirements for genus, species, variety, size, and quality. Landscape Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Trees with cut central leaders, split leaders, or crooked trunks will be rejected. Remove rejected plant materials immediately from Project site. Cost of replacements and project delays shall be borne by the Contractor. All trees approved for the project will be individually tagged with the Landscape Architect’s seals at the job site, and no trees shall be planted without such seals.

J. Selection: Contractor shall locate plant material sources and ensure plants are shipped in timely fashion for installation.
   1. Unauthorized substitutions will not be accepted. If proof is submitted that specific plants or plant sizes are unobtainable, written substitution requests will be considered for the nearest equivalent plant or size. All substitution requests must be made in writing.

K. Preinstallation Conference: Conduct conference at Project site to comply with project requirements as indicated in Division 1 Section "Project Management and Coordination."

L. Boulder Wall Mockups:

   1. Build 20 lineal feet of Boulder Wall to verify selections made under sample submittals and to demonstrate workmanship, aesthetic effects, and set quality standards for materials and execution. Do not proceed with complete installation of Boulder Walls until mockup is approved by the Landscape Architect.

   2. If the Landscape Architect determines the mockups do not comply with requirements, readjust until mockups are approved.

3. Mockups maintained in an undisturbed condition may be incorporated into the completed work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Notify Landscape Architect 3 working days prior to the proposed arrival of plant material on site.

B. Plant materials shall be examined by Landscape Architect at time of delivery on site. This inspection does not constitute final acceptance of plants. All plants will be inspected again at time of final inspection and once again at the end of the warranty period. Any plant found to be unacceptable at any of these inspections shall be immediately removed and replaced.

C. Do not prune trees and shrubs before delivery, except as approved by Landscape Architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery.

D. Handle planting stock by root ball.

E. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set plants in shade, protect from weather and mechanical damage, and keep roots moist.
   1. Set nursery stock on ground and cover roots with mulch.
   2. Do not remove container-grown stock from containers before time of planting.
   3. Water root systems of exterior plants stored on-site as often as necessary to maintain root systems in a moist condition.

1.7 COORDINATION

A. Planting Restrictions: Plant during the following period. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
   1. April 15 to October 15.

B. Weather Limitations: Planting shall not take place when ground is snow covered or frozen.

C. Coordination with Lawns: Plant trees and shrubs after finish grades are established and before planting lawns, unless otherwise acceptable to Landscape Architect.

1.8 JOB CONDITIONS

A. Examine the finish grades, verify that elevations vary no more than 1/2" in 10 feet from the required line and grade set forth in the drawings, taking into account the elevation allowance needed to accommodate mulch depths. Observe the conditions under which work is to be performed, and notify the Landscape Architect of unsatisfactory conditions.
   1.
   2. Excavation:When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify the Landscape Architect for direction prior to planting.

B. Proceed with and complete the landscape work as rapidly as portions of the site become available, working within the seasonal limitations for each kind of landscape work required.

C. The Contractor shall be fully responsible for any damage to existing trees. No pruning, thinning, or cutting will be allowed unless written permission is given by the Landscape Architect. The Contractor shall replace with like kind and size any trees or existing shrubs damaged by him or his sub-contractors.

1.9 ESTABLISHMENT AND MAINTENANCE

A. Maintenance During Construction: During construction of this Work, the Contractor shall be responsible for performing all landscape maintenance activities described in Division 32 – Exterior Improvements, including Section 329000, for the entire existing park, including all Phase 1 landscape and irrigation improvements. The Contractor shall ensure that the existing irrigation system remains fully operational at all times and shall perform all required maintenance operations in accordance with the Specifications for the duration of construction.

B. Maintenance Following Substantial Completion: Upon Substantial Completion of this Work, the Contractor shall perform the maintenance requirements described in this Section for the entire park, including both Phase 1 and Phase 2 areas, for a period of one (1) year.

C. The Contractor shall be fully responsible for maintenance of all newly installed lawn, groundcover, and planter areas for a period of **one (1) year from the date of Substantial Completion**..
   1. Maintenance shall include watering, mowing, edging, fertilizing, cultivating, pruning, weeding, pest and disease control, and all other work necessary to ensure healthy, vigorous growth and a neat appearance.
   2. Contractor shall perform all lawn mowing and edging **once per week during the active growing season** (April 15 to October 15) and as needed during dormant months to maintain a uniform, healthy condition.
   3. Fertilize lawns and planters at intervals recommended by the manufacturer to sustain uniform color and vigor.
   4. Keep all planting beds free of weeds and debris at all times.

D. Irrigation System Maintenance:
   1. Contractor shall be responsible for maintaining, monitoring, and adjusting the irrigation system during the one-year maintenance period to ensure proper coverage and efficient operation.
   2. Contractor shall repair or replace irrigation components that fail due to improper installation, material defects, or damage caused by the Contractor’s operations.
   3. Contractor shall not be responsible for repairs required as a result of vandalism, damage by others, or circumstances beyond the Contractor’s control.
   4. Any irrigation repairs outside the Contractor’s responsibility shall be reported to the Owner in writing within 48 hours of discovery, including a description of the damage and photographs documenting the cause.

E. Reporting: Contractor shall notify the Owner in writing within 24 hours of completing any major maintenance or plant replacement work.

F. Replacement: Any plant that dies or becomes unhealthy during the maintenance period shall be replaced immediately at no cost to the Owner, and the replacement shall be warranted for a new full one-year period from the date of replanting.

G. Neglect: Failure to perform required maintenance shall be considered neglect of contract obligations and may result in withholding of retainage until maintenance is satisfactorily completed.

1.10 WARRANTY/GUARANTEE PERIOD

A. Warranty Limitations – Phase 1 Improvements: The warranty requirements described in this Section apply only to new Work completed under the Phase 2 contract. Existing Phase 1 improvements shall be maintained during construction and throughout the one-year maintenance period as specified, but Phase 1 landscape and irrigation elements are not subject to warranty replacement.

B. Warranty / Guarantee the exterior plants for period indicated below, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, or incidents that are beyond Contractor's control.
   1. Warranty Period for Trees and Shrubs and other plants: One year from date of the Notice of Substantial Completion.
   2. Remove dead exterior plants immediately. Replace immediately unless required to plant in the succeeding planting season.
   3. Replace exterior plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period and at time of substantial completion.
   4. At the conclusion of the guarantee period and prior to final inspection by the Landscape Architect, the contractor shall be responsible for the removal of all tree stakes and tree guys.
   5. Any Replacement plants shall also be warranted for 1 year from the date of replacement planting.
   6. Contractor shall provide specific maintenance instructions to be followed by the owner, including frequency and amount of water to be applied, any special care instructions, etc. These instructions shall be submitted to and reviewed by the Landscape Architect. If the contractor does not provide specific care information, owner will maintain plantings to their best practice and standards and this will be deemed acceptable compliance for any warranty claim.

1.11 SUBSTANTIAL COMPLETION

A. Within 10 days of the end of the establishment period or when the Work is sufficiently complete in accordance with the Contract Documents, written notice requesting a Substantial Completion inspection shall be submitted to the Project Manager by the Contractor. Three days shall be allowed for notification to those persons invited to attend prior to the inspection date. All plantings shall be warranty and guaranteed as stated in Sections 1.9 and 1.10.

PART 2 - PRODUCTS

2.1 TREE AND SHRUB MATERIAL

A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

B. Grade: Provide trees and shrubs of sizes and grades complying with ANSI Z60.1 for type of trees and shrubs required.

C. Size and Planting Condition: As indicated on Drawings.

D. Label each tree and shrub with securely attached, waterproof tag bearing legible designation of botanical and common name.

2.2 SHADE AND FLOWERING TREES

A. Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, complying with ANSI Z60.1 for type of trees required.

B. Small Ornamental Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1; stem form as indicated on Drawings.

C. Multi-stem Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1; stem form as indicated on Drawings.

2.3 DECIDUOUS SHRUBS

A. Form and Size: Deciduous shrubs with not less than the minimum number of canes required by and measured according to ANSI Z60.1 for type, shape, and height of shrub.

2.4 CONIFEROUS EVERGREENS

A. Form and Size: Normal-quality, well-balanced, coniferous evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1.

2.5 BROADLEAF EVERGREENS

A. Form and Size: Normal-quality, well-balanced, broadleaf evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1.

2.6 PERENNIALS

A. Form and Size: Provide healthy, field-grown plants from a commercial nursery, of container size, species and variety shown or listed and complying with requirements of ANSI Z60.1.

2.7 GROUND COVER PLANTS

A. Ground Cover: Provide ground cover of species indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1.

2.8 TOPSOILS AND PLANTING SOIL MIX

A. Provide topsoil and planting soil mixes as specified in section 329119 – Fine Grading and Soil Preparation.

2.9 FERTILIZER

A. Planting Tablets: Fertilizer planting tablets shall be tightly compressed commercial grade planting tablets having a 20-15-5 formula, weighing 21 grams each, as “Blue Chip,” “Grow-Power” planting tablets or “approved equal.” The planting tablets shall be delivered to the site in the original, unopened containers, bearing the manufacturer’s guaranteed analysis. Any damaged tablet will not be accepted.

2.10 LANDSCAPE EDGING

A. Concrete Mow Curb: As detailed on Drawings.

B. Metal Edging: As detailed on the Drawings.

2.11 BARK MULCH

A. Bark Mulch: Clean, medium coarseness, shredded bark mulch. Submit sample for approval prior to placement.

2.12 CRUSHED STONE MULCH

A. Stone mulch color and size as specified on the drawings. Crushed stone to be hard, durable, washed free of loam, sand, clay and other foreign substance. Submit samples of a range of colors for color selection and approval to be approved of Landscape Architect. Submit sample for approval of size and color prior to delivery to the site.

2.13 WEED CONTROL FABRIC

A. Weed Control Fabric shall be a roll type polypropylene or polyester fabric and shall be woven, needle punched or non-woven and treated for protection against deterioration due to ultraviolet radiation. Fabric shall be minimum 99 percent opaque to prevent photosynthesis and seed germination from occurring yet allowing air, water, and nutrients to pass thru. Minimum weight shall be 5 ounces per square yard with a minimum thickness of 20 mils with a 20 year guarantee.

2.14 LANDSCAPE BOULDERS

A. New Boulders: New boulders as required on the drawings shall be hard, durable rock materials in sizes as noted on the drawings and details. If sizes are not called out on drawings or details provide boulders in sizes as follows: 3-foot diameter (30%), 4 foot diameter (50%), and 5 foot diameter (20%). Color shall match or compliment stone mulch specified on site. Landscape boulders shall be provided in quantities, and general shapes as indicated on drawings. Representative samples shall be submitted at the site for approval of color, shape, and size. Approval of sample does not constitute final acceptance. All boulders shall be approved on site by Owner’s Authorized Representative upon delivery to verify compliance with the sample and shape and size.

2.15 LANDSCAPE BOULDER WALL INSTALLATION

A. Install boulder walls as detailed in locations shown on the drawings. See grading plans for elevations of top and bottom of wall. Layout and location of boulder walls shall be reviewed on-site by Landscape Architect prior to installation.

B. Install mock-up wall and obtain approval prior to completing entire landscape boulder wall installation as per section 1.5 Quality Assurance.

2.16 STAKES AND GUYS

A. Tree stakes shall be two-inch (2”) diameter, by eight-foot (8’) minimum long straight grained pine and driven to a minimum depth of eighteen inches (18”) into firm soil beneath plant pit excavation. Height of stakes shall be below tree branching.

B. Tree ties shall be VIT Cinch Tie attached to stake with 1- ¼” galvanized threaded nails. Field sample shall be approved by the Owner’s Representative

C. Guy wires and anchors on all evergreens and trees 4” caliper or larger shall be duckbill tree support system model # 68 DTS including anchors, galvanized steel, vinyl-coated cable, turnbuckles, tree collars and cable clamps, all pre-assembled. Install per manufacturer’s specifications.

D. Safety flagging for all diagonal guy wires shall consist of one half-inch (1/2”) PVC sleeves.

2.17 MISCELLANEOUS PRODUCTS

A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

B. Herbicide:
1. Provide selective post emergent herbicide for use in weed control. Provide Round-up or approved equal.
Provide pre-emergent herbicide for use in planter beds for weed control. Provide Treflan or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive and plants for compliance with requirements and conditions affecting installation and performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Locate all underground utilities prior to digging. Do not place plants on or near utility lines. Protect structures, utilities, sidewalks, pavements, and other facilities, and lawns and existing exterior plants from damage caused by planting operations.

B. Herbicide Treatment: All planting beds shall be weed free prior to commencing soil placement, fine grading, and planting. Treat areas with a non-selective herbicide as necessary a minimum of ten (10) days prior to commencement of any planting or irrigation work to ensure weed free planting areas. Herbicide applications shall be applied in accordance with manufacturer's recommendations and in accordance with section 3.16 Herbicide Application and Weed Control. The poisoned vegetation shall be allowed to completely die back, including the roots, before proceeding with the work. Dead vegetation shall then be removed from the site and disposed of in a legal manner.

C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

D. Lay out individual tree and shrub locations and areas for multiple exterior plantings. Stake locations, outline areas, adjust locations when requested, and obtain Landscape Architect's acceptance of layout before planting. Make adjustments as required by Landscape Architect.

E. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

3.3 PLANTING BED ESTABLISHMENT

A. Prepare subgrade of planting beds and spread Planting Soil Mix in accordance with specification section 329119 - Fine Grading and Soil Preparation.

B. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture and in accordance with specification section 329119 – Fine Grading and Soil Preparation. Roll and rake, remove ridges, and fill depressions to meet finish grades prior to adding mulch.

C. Restore planting beds if eroded or otherwise disturbed after finish grading and before planting.

D. Install Landscape Edging as detailed in all location shown on the drawings.

3.4 TREE AND SHRUB EXCAVATION

A. Pits and Trenches: Excavate circular pits with sides sloped inward. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.

B. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

C. Prior to planting, fill excavated tree/shrub pit with water and allow to percolate out. If after 24 hours, the water has not percolated out of the pit, notify the Owner's Authorized Representative. Do not plant until the problem has been corrected.

3.5 TREE AND SHRUB PLANTING

A. Set balled and burlapped stock plumb and in center of pit or trench with top of root ball 1"-2" above adjacent finish grades.
   1. Remove burlap, wire baskets, twine, and wrappings from root balls, taking care not to disturb root balls. Do not use planting stock if root ball is cracked or broken before or during planting operation.

2. Place planting soil mix around root ball in 12 inch lifts, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.

B. Set container-grown stock plumb and in center of pit or trench with top of root ball flush with adjacent finish grades.
1. Carefully remove root ball from container without damaging root ball or plant.
2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.

C. Add fertilizer plant tablets to planting pit. Fertilizer tablets shall be placed no deeper than eight inches (8”) from finished grade and two inches (2’) from the root ball. Add the required number of tablets as specified below.
1. One (1) tablet per one (1) gallon container.
2. Two (2) tablets per five (5) gallon container.
3. Three (3) tablets per ten (15) gallon container.
4. Four (4) tablets per two-inch (2”) caliper tree.
5. Six (6) tablets per three-inch (3”) caliper tree.
6. Eight (8) tablets per four-inch (4”) caliper tree.

D. Prepare a watering basin around the trunk as indicated on Drawings.

E. Mulching: Apply specified thickness of mulch extending to edge of planting pit or trench. Do not place mulch within 4 inches of trunks or stems.

3.6 TREE AND SHRUB PRUNING

A. Pruning shall be limited to the minimum necessary to remove dead or injured twigs and branches. All cuts, scars and bruises shall be properly treated according to the directions of the Landscape Architect. Proper pruning techniques shall be used. Do not leave stubs and do not cut the leader branch. Improper pruning shall be cause for rejection of plant material.

3.7 GUYING AND STAKING

A. Trees should not be staked except in rare cases. Stake and guy trees only when required by site conditions to ensure viability of the tree and approved by Landscape Architect.

B. Upright Staking and Tying: As detailed, trees shall be firmly staked, as shown on the Drawings. Stakes shall be of even height and neat in appearance, and shall not injure the root balls.

C. Guying and Staking: As detailed, trees shall be firmly anchored and guyed as shown on the Drawings.

3.8 GROUND COVER AND PERENNIAL PLANTING

A. Set out and space ground cover and plants as indicated.

B. Dig holes large enough to allow spreading of roots, and backfill with planting soil.

C. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

D. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

E. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.9 PLANTING BED MULCHING

A. Mulch backfilled surfaces of tree wells, planting beds and other areas indicated on drawings.
   1. Mulch: Apply bark or stone mulch to the depths and locations indicated on the drawings. Do not place mulch against plant stems.

3.10 WEED CONTROL FABRIC INSTALLATION

A. Remove all vegetation, including roots, from within the areas specified to receive Crushed Stone Mulch. Completely cover areas with the specified weed control fabric prior to placement of crushed stone. Overlap cut edges a minimum of twelve (12) inches and secure to subgrade according to manufacturer's recommendations. **Weed control fabric installation shall be inspected by Owner's Authorized Representative prior to covering.**

3.11 LANDSCAPE BOULDERS

A. Install landscape boulders as detailed and in locations shown on the drawings. Boulders shall be installed in locations as generally shown on the plans as approved by the Landscape Architect.

3.12 LANDSCAPE BOULDER WALL INSTALLATION

A. Install boulder walls as detailed in locations shown on the drawings. See grading plans for elevations of top and bottom of wall. Layout and location of boulder walls shall be reviewed on-site by Landscape Architect prior to installation.

B. Install mock-up wall and obtain approval prior to completing entire landscape boulder wall installation as per section 1.5 Quality Assurance.

3.13 LANDSCAPE EDGING INSTALLATION

A. Concrete Mow Curb: Install concrete edging materials as detailed in locations shown on the drawings.

B. Steel and Metal Edging: Install as detailed and in accordance with manufacturer's installation instructions in locations shown on the drawings.

3.14 WATERING

A. All plants shall be thoroughly watered immediately after planting; this shall mean full and thorough saturation of all backfill in the pits and beds during the same day of planting. Water shall be applied only by open end hose at very low pressure to avoid air pockets, injury or washing. When planted, watered, and fully settled the plants shall be vertical and the stand shall be slightly below the stand in the nursery.

3.15 SUPPLEMENTAL WATERING

A. **The Contractor shall hand water newly planted trees, twice a week for eight weeks**.

B. A minimum of five (5) gallons per tree per watering is required. Amount may vary pending seasonal rainfall.

C. Lightweight pickup truck with 55-gallon drum may be used to water trees. Any other method must be approved by Landscape Architect.

D. The Contractor must locate and stake any sprinkling head or valve box within 10' feet of proposed tree location, and must establish direction of lateral or main sprinkling line that serves the staked sprinkler head or valve box. (This procedure will help eliminate hitting underground sprinkling system.)

E. The Contractor shall take extra care to watch for sprinkling heads and valve boxes in lawn area. Any broken sprinkling heads or valve boxes, etc., shall be replaced by Contractor at no expense to owner.

3.16 HERBICIDE APPLICATION AND WEED CONTROL

A. Application of pre-emergent herbicide is required. The contractor shall maintain the site weed free until the end of the establishment period.

B. Apply herbicides so no damage to protected vegetation occurs whether inside or outside the project site. Damage to protected vegetation or vegetation outside the project site will be reimbursed to the owner or replaced by the Contractor in a manner satisfactory to the Owner's Authorized Representative, and according to the International Society of Arboriculture Method of "Valuation for Landscape Trees, Shrubs, and Other Plants," latest edition.

C. Post Emergent Herbicide:
1. Mix and apply post-emergent herbicide according to manufacturer's recommendations indicated in the "Weeds Controlled" section of the label, and apply to undesired, actively growing vegetation.
2. Apply the spray mixture so that all undesired vegetation is uniformly covered, but avoid causing over-spray and drift. Spray target vegetation so that it is wet, but short of run-off.
3. Prune all suckers at the base of any trees to the soil level prior to application.
4. Do not apply post-emergent herbicide in any of these conditions: When rainfall is expected within six hours; when there is growth stress as a result of drought, insects, disease, or plant damage, or when there is heavy dust on plants.
5. Do not walk or permit other traffic on treated areas when they are wet from application. Shoes and equipment may track spray solution to areas where vegetation is not to be treated.
6. Repeat application, as necessary to completely eradicate undesired vegetation.

D. Pre-emergent Herbicide:
1. Mix and apply pre-emergent herbicide according to manufacturer's recommendations and information on the side panel, and the following: Use granular applicators designed to apply herbicide at Manufacturer's suggested highest rate.
2. Calibrate the applicator according to the manufacturer's directions prior to use and check frequently during application to be sure the equipment is working properly and distributing the granules uniformly. Do not apply more than the recommended amount.
3. Apply granular herbicide according to manufacturer's recommendations and on-site conditions and soil preparation requirements or restrictions appropriate to the herbicide used.
4. The pre-emergent application must be followed within 8 hours with overhead watering or rainfall equivalent to 1/2".

E. License: Use a state licensed applicator to apply herbicide.

F. Mechanical Control:
   1. Mechanically control the weeds by pulling, cutting, hoeing, or by any other directed means approved by the Owner's Authorized Representative.
   2. Weeds in a dormant stage or other condition which cannot be effectively controlled with post-emergent herbicide shall be removed from the site by mechanical methods.

3.17 ESTABLISHMENT AND MAINTENANCE

A. Begin Maintenance immediately after planting.

B. Maintain plants for the specified time frame previously indicated above and throughout the Establishment Period.

C. Maintain plants by watering, pruning, cultivating and weeding as required for healthy growth. Restore planting saucers. Treat as required to keep plant materials free of insects and disease.

D. The Contractor shall provide the owner with an approved irrigation schedule.

E. The Contractor shall provide on-site maintenance instructions to the Owner's Authorized Representative and maintenance personnel prior to turning the project over to the Owner.

3.18 CLEAN-UP AND PROTECTION

A. During exterior planting, keep adjacent paving and construction clean and work area in an orderly condition.

B. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged exterior planting.

3.19 DISPOSAL

A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property. If approved by Owner, excess soils may be wasted on site.

END OF SECTION 329000

SECTION 329119 – FINE GRADING AND SOIL PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Related Sections include the following:

1. Section 329000 – Planting
2. Section 329223 – Sodding

1.3 SUBMITTALS

A. At least 30 days prior to ordering materials, the Contractor shall submit to the Landscape Architect representative samples, certifications, manufacturer's literature, and certified test results for all materials as specified below. No materials shall be ordered or delivered until the required submittals have been reviewed and stamped approved by the Landscape Architect. Delivered materials shall match the approved samples.

B. Approval shall not constitute final acceptance. The Landscape Architect reserves the right to reject, on or after delivery, any material that does not meet these Specifications.

C. List of submittals required.

1. Sample of manufactured Planting Soil Mix and soil analysis testing results.
2. Sample of topsoil (component of the Planting Soil Mix) and soil analysis testing results
3. Sample of organic compost (component of the Planting Soil Mix) and sieve analysis.
4. Sample Expanded Shale Fines Soil Conditioner (component of the Planting Soil Mix) and product data.

1.4 QUALITY ASSURANCE

A. The following standards apply to the work of this Section:

1. AOAC: Association of Official Agricultural Chemists.
2. ASA: Methods of Soils Analysis, American Society of Agronomy, Soil Science Society of America, Inc., Madison Wisconsin, latest edition.
3. American Society for Testing and Materials (ASTM).
4. All applicable local codes and regulations.

B. It is the intent of this specification that all materials herein specified and shown on the drawings shall be of the highest quality available and meeting the requirements specified.

C. The work of this Section shall be performed by a Contracting firm that has successfully installed work of a similar quality, schedule requirement, and construction detailing with a minimum of five (5) years experience.

D. All work shall be performed in accordance with the best standards of practice relating to the trade and under the continuous supervision of a competent foreman capable of interpreting the Drawing and Specifications.

E. Soil shall not be worked when moisture content is so great that excessive compaction occurs, nor when it is so dry, that dust will form in air or that clods will not break readily. Water shall be applied, if necessary, to provide ideal moisture content for tilling and for planting.

F. All accumulated debris and rubbish shall be cleaned up and removed from the site before commencing work. Clear and grub all dead vegetative matter. The site shall be weed free prior to proceeding with any work.

G. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

H. Topsoil Analysis: Furnish a soil analysis for all topsoil proposed for use as specified in this section by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of topsoil.

1. Report suitability of topsoil for lawn growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.

I. Compost Testing Laboratory Qualifications: An independent, with the experience and capability to conduct testing indicated following U.S. Composting Council Seal of Testing Assurance procedures, or equivalent.

J. Compost Analysis: Provide documentation from supplier that compost has reached monitored temperature of 140 degrees Fahrenheit for at least one week.

1. Test representative sample(s) of compost for the following parameters: pH, soluble salts, percent moisture, percent organic matter, particle size, and nutrient content, including: Nitrogen (N), Phosphorus (P), Potassium (K), Calcium (Ca), and Magnesium (Mg).

2. Test compost for maturity. Provide Carbon-Nitrogen ratio.

1.5 JOB CONDITIONS

A. Examine the subgrade, verify the elevations to be no more than plus or minus 2” above or below subgrade elevation which should allow for the depths required for topsoil and mulch throughout the planted areas. Observe the conditions under which work is to be performed and notify the Landscape Architect of unsatisfactory conditions.

PART 2 - PRODUCTS

2.1 PLANTING SOIL MIX

A. Planting Soil Mix: Shall consist of a ratio by volume of 80 percent topsoil, 10 percent organic compost, and 10 percent Utelite Fines.

1. The Contractor shall provide Planting Soil Mix at locations and depths indicated on the Drawings to complete all planting areas, as specified in this Section and as directed by the Landscape Architect. Planting Soil Mix shall be produced by homogeneously blending the specified components prior to placement.
2. Do not commence with mixing Planting Soil Mix until the review and approval of soil test results, organic compost certification submittal, and expanded shale fines soil conditioner submittal.

2.2 TOPSOIL

A. Native or Imported topsoil used as a component of the Planting Soil Mix for turf areas, plant beds, and tree planting pits. Submit soil test results certifying that the topsoil meets the texture and analysis outlined below. Topsoil not meeting the outlined criteria will not be accepted.

1. Source: Topsoil will be obtained from the following sources:
   a. Imported from naturally well-drained areas with a history of satisfactory vegetative growth that has not been stripped before.

B. Topsoil shall be “fine sandy loam” or “sandy loam” determined by mechanical analysis (ASTM D-22) and based on the “USDA Classification System.”

C. Topsoil shall not contain less than four percent (4%) or more than eight percent (8%) organic matter as determined by the loss on ignition of oven-dried samples, unless topsoil will be amended with organic compost.

D. The acidity range of the topsoil shall be pH 5.5 to 7.5.

E. Topsoil shall be free of stones 1-1/2 inch or larger in any dimension and other extraneous materials harmful to plant growth. Soluble salts <2 (dS/m or mmho/cm) and sodium absorption ration (SAR) <3. The electrical conductivity (EC2) of a 1:2 soil-water suspension shall be equal to or less than 1.0 millimhos/cm. (Test minus sieve Number 10 material).

F. No topsoil shall be delivered to the site or placed in planting areas until topsoil test results and recommendations have been reviewed and approved by the Landscape Architect. Such approval shall not constitute final acceptance. The Landscape Architect shall reject any material delivered to the site, which, after on-site, post-delivery testing, does not meet these specifications.

2.3 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 6 to 8; moisture content 25 to 35 percent by weight; 100 percent passing through 1/2-inch sieve; soluble salt content of <5 dS/m or mmho/cm; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.

B. Compost shall conform as follows:

1. Tested at minimum, every six months for noxious weeds.
2. Organic matter source (feedstock): Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.
3. Organic Matter Content: 60 to 80 percent of dry weight as determined by ash method.
4. Free of refuse (less than 1 percent by dry weight), plastics, contaminants or any material toxic to plant growth.
5. Processed to meet U.S. Composting Council's Seal of Testing Assurance Program, or equivalent.
6. Carbon to Nitrogen Ratio: 40 to 1 or lower.
7. Composted for a minimum of 9 months and reach a monitored temperature of 140 degrees Fahrenheit for at least one week.

Toxic Elements	Maximum Concentration (mg/kg dry weight)
Arsenic	41
Cadmium	39
Copper	1500
Lead	300
Mercury	17
Molybdenum	75
Nickel	420
Selenium	36
Zinc	2800

2.4 UTELITE FINES

A. Expanded shale lightweight aggregate. Available from Utelite Corporation, (801) 243-9348.

PART 3 - EXECUTION

3.1 PREPARATION

A. The Contractor shall remove, clear, and grub existing turf sod, weeds, and other vegetation as indicated on the drawings.

B. Planting Soil Mix placement shall not commence until rough grades have been approved by the Landscape Architect.

C. The Contractor shall remove existing soil and replace with Planting Soil Mix in and all planting bed areas that have been re-graded (except within existing tree drip lines where excavation or placement of soils may damage the tree), and in all plant pits as specified in this section and as directed by the Landscape Architect.

D. Placement of Planting Soil Mix:

1. Immediately prior to placing and spreading the Planting Soil Mix loosen the subgrade of planting beds to a minimum depth of SIX inches (6"). Remove all stones greater than 3/4" in diameter and all weeds, sticks, debris, or rubbish. Such material shall be removed from the site and legally disposed.
2. Spread Planting Soil Mix over loosened subgrade to the depth indicated on the drawings. Do not spread Planting Soil Mix if subgrade is frozen, muddy, or excessively wet.

E. Planting Soil Mix shall be backfilled in lifts of no more than six inches (6”). Compact each lift by tamping to 85% prior to placing next layer of backfill.

F. Add recommended soil amendments at rates specified in soil analysis recommendations and as directed by the Landscape Architect. Rototill amendments into the top 6 inches of soil to achieve a uniform mixture.

1. Following the incorporation of soil amendments, the surface shall be re-compacted to meet the requirements of this section.

3.2 FINE GRADING

A. When rough grading, weeding, soil preparation and soil amending have been completed, and soil has been thoroughly water settled, all planting areas should be smoothly graded, ready for placement of plant materials.

B. Fine grading shall be done when soil is at optimum moisture content.

C. Finish grades shall be smooth, even and on a uniform plane with no abrupt changes of surface. The finish grade shall not vary more than one half inch (1/2”) in ten feet (10’) from the required line, and grade set forth in the Drawings. Adjustments of finish grades shall be made at direction of Landscape Architect as required.

D. Finish grade of mulch in shrub and groundcover areas shall be flush with paved surfaces, after top-dressed with specified thickness of mulch. Finish grade of soil in all turf areas shall be one inch (1”) below all paved surfaces before laying sod.

END OF SECTION 329119

SECTION 329219 - SEEDING

PART 1 GENERAL

1.1 SUMMARY

A. The work to be performed under this division shall consist of furnishing all labor, equipment, and materials for producing a full stand of grass growing on all areas indicated on the plans. The work shall consist of, but not be limited to: grading, seed bed preparation, seeding, fertilizing, weed control, establishment, maintenance, guarantees, and repair in accordance with the project plans and specifications.

B. Related Sections:

1. Section 329119 – Fine Grading and Soil Preparation
2. Section 328400 – Irrigation
3. Section 329000 – Planting

1.2 REFERENCES

A. ISTA - The International Seed Testing Association

B. AOSA - Association of Official Seed Analyst

C. AASCO - The Association of American Seed Control Officials

D. Utah Seed Law: Utah Code – Title 4, Chapter 6

1.3 SEEDED AREA ESTABLISHMENT AND MAINTENANCE

A. Contractor shall be responsible for maintaining and establishing all seeded areas for a period of **one (1) year** from the date of Substantial Completion. Maintenance shall include all operations necessary to promote germination, growth, and establishment of a healthy, uniform, and weed-free stand of turf or native seed mix as specified:

B. Maintenance Responsibilities:
1. Maintain seeded areas by watering, weeding, re-seeding, mowing, fertilizing (if required), and performing any other work necessary to ensure healthy establishment.
2. Maintain irrigation or temporary watering systems in good working order throughout the maintenance period to provide sufficient moisture for germination and growth.
3. Inspect seeded areas regularly and perform maintenance promptly to correct any washouts, bare spots, or weed infestations.
4. Keep all seeded areas free of weeds, debris, and undesirable vegetation.
5. Mow seeded areas as directed by the Landscape Architect to promote establishment and discourage weed competition.

C. Repair and Replace:
1. Re-seed any areas that fail to establish, erode, or die at no additional cost to the Owner.
2. Each re-seeded area shall carry a **new full one-year establishment and warranty period** beginning from the date of re-seeding.

D. Irrigation Maintenance:
1. Contractor shall maintain and adjust the irrigation system or temporary watering means to provide adequate coverage and promote proper establishment

2. Contractor shall repair or replace irrigation components that fail due to improper installation, material defects, or damage caused by the Contractor's operations.
3. Contractor shall **not** be responsible for irrigation repairs or damage caused by vandalism, animals, or others beyond the Contractor's control.
4. Any damage discovered that is not the Contractor's responsibility shall be reported to the Owner within 48 hours, with written and photographic documentation.

E. Reporting: Notify the Owner and Landscape Architect in writing within 48 hours of completing major maintenance or re-seeding activities. Provide documentation of work performed and areas affected.

F. Final Acceptance: Final acceptance of seeded areas shall occur only after the one-year maintenance period has expired and seeded areas exhibit uniform, healthy, and sustainable growth, as determined by the Landscape Architect.

G. Damage by Others:
1. Areas or plants damaged due to vandalism, pedestrian or vehicular traffic, animal activity, or other causes beyond the Contractor's control shall not be the responsibility of the Contractor to repair or replace at their cost.
2. Contractor shall notify the Owner in writing within 48 hours of discovery of such damage, including photographs and a brief description.
3. If directed by the Owner, Contractor shall make necessary repairs or replacements as additional work compensated by change order.

H. Watering (for irrigated areas only): Provide and maintain temporary piping, hoses, and watering equipment to convey water from sources and to keep seeded area uniformly moist to a depth of 2 inches for the first two weeks after planting or as recommended by seed vendor (except for unirrigated areas that are to be seeded after October 15th as specified herein). Water at the rate according to seed vendor's recommendations thereafter during the maintenance period.

I. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.

1.4 SUBMITTALS:

A. Product Data: For each type of product indicated in the specification.

B. Certification of Seed: From seed vendor for each seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each grass seed mixtures, identifying source, including name and telephone number of supplier.

C. Product Certificates: For fertilizers, from manufacturer.

D. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

1.5 SUBSTANTIAL COMPLETION

A. The date of Substantial Completion for the seeding will be **when the Establishment and Maintenance Period has been completed for all seed areas and seeded areas are established in accordance with the requirements of this specification and approved** by Landscape Architect and Owner's Authorized Representative. This will be determined by observation by the Landscape Architect and Owner's Representative. **Seeding Contractor shall coordinate with General Contractor to ensure construction sequencing allows adequate time for completion of the Establishment and Maintenance period prior to overall project completion.**

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by County for maintenance of grasses during a calendar year. Submit before expiration of required maintenance periods.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful grass seed establishment.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
3. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:

    a. Landscape Industry Certified Technician - Exterior.
    b. Landscape Industry Certified Lawncare Manager.
    c. Landscape Industry Certified Lawncare Technician.

4. Herbicide Applicator: State licensed, commercial.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

PART 2 MATERIALS

2.1 SEED MATERIALS:

A. Seed Mix
1. Provide Osgood Sod's "Meadow Grass" seed mix, applied strictly in accordance with the manufacturer's written recommendations for rate, depth, and seasonal timing.
2. Deliver seed in original, sealed, and labeled containers identifying the seed type, purity, germination rate, and supplier certification.
3. Substitutions for the "Meadow Grass" mix will not be permitted without prior approval from the Landscape Architect.

B. Seed mixtures shall meet the minimum tested requirements of Utah Seed Law. The seed shall be the current year's crop, guaranteed by the supplier as follows:

80% Germination Rate
72% Minimum Purity
No more than 2% inert matter
No noxious weeds
No more than 1/10% weed seed
28 pounds per bushel or equivalent.
80% pure live seed

C. Apply the seed mixture at a rate as indicated. Prior to seeding the Contractor shall arrange for the inspector to check the seed in storage. Labels shall be obtained for the project Landscape Architect's file.

2.2 MULCH (WOOD FIBER):

A. Wood Fiber Mulch shall be a wood material, which has been shredded, pulverized, or dissolved into small fibers. The mulch shall have been processed so that it will have no germination and so that it forms a blotter-like ground cover. The material shall be air dry and contain no more than 15% moisture by weight.

B. Wood Fiber Mulch shall be included as part of the Hydromulch slurry at a rate of 1500 lbs per acre.

2.3 TACKIFIER

A. Tackifier shall be M-Binder tackifier derived from the plantago plant, or approved equal.

B. Tackifier shall be applied as part of the hydromulch slurry at a rate of 80 lbs per acre.

2.4 HERBICIDES

A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

PART 3 EXECUTION:

3.1 EXAMINATION:

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
3. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by the Project Manager and replace with new planting soil.

3.2 SEED BED PREPARATION:

A. Prepare subgrade of seed beds and spread Planting Soil Mix and topsoil in accordance with specification section 329119 – Fine Grading and Soil Preparation.

1. Herbicide Treatment: All sod beds shall be weed-free prior to commencing soil placement, fine grading, and planting. Treat areas with a non-selective herbicide as necessary to ensure weed-free planting areas. Herbicide applications shall be applied in accordance with the manufacturer’s recommendations and in accordance with section 3.12 Herbicide Application.

B. Spread and evenly distribute the specified Planting Soil Mix or Topsoil over the areas to be seeded to the depth specified on the drawings and in accordance with specification section 329119 – Fine Grading and Soil Preparation.

1. Remove all stones greater than 3/4" in diameter and all weeds, sticks, debris, or rubbish. Such material shall be removed from the site and legally disposed.

C. Fine grade in accordance with specification section 329119 – Fine Grading and Soil Preparation.

D. The topsoil shall be moist enough to permit it to be worked properly. It shall not be so dry it is powdery nor so wet that it will puddle, or become hard when it dries.

E. The topsoil shall be applied and graded smooth so that when settled the surface is free from ridges and depressions which will puddle or hold water.

F. Roll any small areas containing new topsoil with hand roller. After rolling at a weight of 150-200 pounds per linear foot of roller, the bed shall again be graded to the specified grade with a smooth surface.

G. Prepare final grade of large areas by passing a land-plane in three different direction over the entire area to be planted.

H. The finished grade of the seedbed ready for seeding shall be 1 inch below the top surface of any concrete or paved area and will be free of weeds.

I. Finished grades of areas adjoining existing native vegetation areas shall match the existing grade in every spot.

J. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

K. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

a. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.

b. Protect grade stakes set by others until directed to remove them.

3.3 SEEDING AND MULCHING:

A. SEED MIX SEEDING: Use the two step **broadcast seeding/hydro-mulching** method described below.
1. Prepare the seed bed as specified above.
2. Sow the seed mixture in two directions using an approved mechanical seeder at the rate specified and rake or harrow seed lightly into soil. Seed shall be sown in two directions with half of the seed mix being used in one direction and the other half of the mix being used to seed in the other direction.
3. Spray a mixture of water, tackifier, and Wood Fiber Mulch under pressure at the rates specified onto the prepared seedbed

3.4 RE-SEEDING:

A. The Contractor shall re-seed all bare ground spots more than 12 inches in any dimension that have not produced a stand of grasses and plants. Such re-seeding shall be at the Contractor's expense and shall comply with all applicable specifications in this section. The maintenance and guarantee period shall be the same for reseeded areas as for new lawn areas.

3.5 SMALL AREA REPAIR AND SEEDING:

A. Small area repair and seeding shall consist of:

a. Preparing the seed bed as specified.
b. Sowing the seed mixture uniformly over the area.
c. Raking the seed and fertilizer into the soil.

B. Any area less than 2,000 square feet, but larger than 1 square foot shall be seeded by this method. Areas larger than 2,000 square feet shall be re-seeded using the two step broadcast seeding/hydromulching method described above

C. All slopes greater than 25 percent or any having a washing problem shall be protected with erosion-control blankets or shall be mulched with straw at a rate of one and one-half bales per thousand square feet. Jute, fiber matting, enkamat, curlex blanket, or other erosion control materials may be used upon approval of the project Landscape Architect.

3.6 PROTECTION

A. The Contractor shall take all measures necessary to protect the new seeded areas from being run over by vehicles, eroded away by wind and water, or loss due to lack of water or disease.

3.11 ESTABLISHMENT, MAINTENANCE AND GUARANTEE

A. General: Maintain and establish seed areas by herbicide treatment, weeding, replanting, and performing other operations as required to establish healthy, viable grass stand (see above section). Roll, re-grade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth grass stand. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and grass damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply herbicide and other treatments as required to keep grass and soil free of weeds, pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

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3.12 HERBICIDE APPLICATION

A. Apply herbicides and other chemical products and biological control agents according to requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with County’s operations and others in proximity to the Work. Notify Project Manager before each application is performed.

B. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.14 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by seeding work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off County's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Remove non-degradable erosion-control measures after grass establishment period.

E. The Contractor shall remove weekly, or as sufficient amounts accumulate, all unused material, or waste material from the premises. The site shall be left in a clean and orderly condition.

3.15 FINAL INSPECTION

A. Within 10 days of the end of the establishment period, a written notice requesting an inspection shall be submitted to the Project Landscape Architect.

B. Allow a minimum of three (3) working days for notification to those persons invited to attend prior to the inspection date.

C. All areas designated for seed mix on the plans shall be covered with a reasonable stand of grass and acceptable to the Project Landscape Architect.

D. All areas found unacceptable shall be reseeded in accordance with the above re-seeding specifications and shall be maintained by contractor until area is covered with an acceptable stand of grass and acceptable to the Project Landscape Architect. Such areas shall be maintained and guaranteed as stated above.

END OF SECTION 329219

SECTION 329223 - SODDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Furnish and install sodded lawn as described in Contract Documents, for all lawn areas.

B. Related Sections include the following:

1. Section 329119 – Fine Grading and Soil Preparation
2. Section 328400 – Irrigation
3. Section 329000 – Planting

1.3 QUALITY ASSURANCE

A. The work of this Section shall be performed by a Contracting firm, which has successfully installed work of a similar quality, schedule requirement, and construction detailing with a minimum of five (5) years experience. Proof of experience shall be submitted per Samples, Submittals & Testing, refer to Section 1.6.

B. All work shall be performed in accordance with the best standards of practice relating to the trade and under the continuous supervision of a competent foreman capable of interpreting the Drawings and Specifications.

C. All accumulated debris and rubbish shall be cleaned up and removed from the site before commencing work. Clear and grub all dead vegetative matter. The site shall be weed free prior to proceeding with any work.

D. Pre-Installation Meetings

1. Participate in pre-installation meetings.

1.4 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and

molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 329119 "Soil Preparation and Fine Grading" and drawing designations for planting soils.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

F. Substantial Completion: The point in time when the Work is sufficiently complete, in accordance with the Contract Documents, that the owner can occupy or use the Work for its intended purpose.

1.5 STANDARDS

A. The following standards and definitions shall apply to the work of this Section.

1. AOAC: Association of Official Agricultural Chemists
2. ASPA: American Sod Producers Specifications for Turfgrass Sod Materials and Transplanting/ Installing.
3. ASTM: American Society for Testing and Materials

1.6 SAMPLES AND SUBMITTALS

A. At least thirty (30) days prior to intended use, the Contractor shall provide the following samples and submittals for approval. Do not order materials until Landscape Architect's approval of samples, certifications, or test results has been obtained. Delivered materials shall closely match the approved samples.

1. Sod: Submit a supplier's certificate showing sod composition by grass species conforms to the Specification requirements for each type of sod. Certification shall identify the source and include the name and telephone number of the supplier.

B. Maintenance Instructions: At the time of Acceptance, the Contractor shall submit complete maintenance instructions for lawn care for the Owner's use. The instructions shall be reviewed for approval by the Landscape Architect as a pre-condition for Acceptance.

1.7 DELIVERY, STORAGE, & HANDLING

A. Sod: Harvest, deliver, store, and handle sod in accordance with requirements of "American Sod Producers (ASPA) Specifications for Turfgrass Sod Materials and Transplanting/Installing," "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod

within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.

B. During wet weather, allow sod to dry sufficiently to prevent tearing during lifting and handling.

1. During dry weather, protect sod from drying. Water as necessary to ensure vitality and to prevent excess loss of soil in handling.
2. Sod which dries out will be rejected.

C. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

1.8 COORDINATION

A. Planting Restrictions: Plant during the following period. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. April 15 to October 15.

B. All newly sodded areas shall be rolled as specified immediately after sod has been laid.

1.9 LAWN MAINTENANCE AND ESTABLISHMENT PERIOD

A. The Contractor shall be fully responsible for maintenance of all newly installed lawn, groundcover, and planter areas for a period of **one (1) year from the date of Substantial Completion**..
1. Maintenance shall include watering, mowing, edging, fertilizing, cultivating, pruning, weeding, pest and disease control, and all other work necessary to ensure healthy, vigorous growth and a neat appearance.
2. Contractor shall perform all lawn mowing and edging **once per week during the active growing season** (April 15 to October 15) and as needed during dormant months to maintain a uniform, healthy condition.
3. Fertilize lawns and planters at intervals recommended by the manufacturer to sustain uniform color and vigor.
4. Keep all planting beds free of weeds and debris at all times..

B. Irrigation System Maintenance:
1. Contractor shall be responsible for maintaining, monitoring, and adjusting the irrigation system during the one-year maintenance period to ensure proper coverage and efficient operation.
2. Contractor shall repair or replace irrigation components that fail due to improper installation, material defects, or damage caused by the Contractor’s operations.
3. Contractor shall not be responsible for repairs required as a result of vandalism, damage by others, or circumstances beyond the Contractor’s control.

4. Any irrigation repairs outside the Contractor's responsibility shall be reported to the Owner in writing within 48 hours of discovery, including a description of the damage and photographs documenting the cause.

C. Reporting: Contractor shall notify the Owner in writing within 24 hours of completing any major maintenance or plant replacement work

D. Replacement: Any plant that dies or becomes unhealthy during the maintenance period shall be replaced immediately at no cost to the Owner, and the replacement shall be warranted for a new full one-year period from the date of replanting.

E. Neglect: Failure to perform required maintenance shall be considered neglect of contract obligations and may result in withholding of retainage until maintenance is satisfactorily completed.

F. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawn uniformly moist to a depth of 2 inches for the first two weeks after planting. Water at the rate given in the turfgrass vendor's written recommendations thereafter during the maintenance period.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.

G. Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 30 percent of grass height. Remove no more than 30 percent of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

1. Mow Kentucky Bluegrass 2-3 inches high.

2. Mow Low Water Use Grasses 3-4 inches high. Once established, mowing should only be required monthly at most.

H. Kentucky Bluegrass lawn Post fertilization: Apply fertilizer every 21 days following initial application throughout maintenance period.

1. Use 16-16-16 fertilizer mixture, applying one pound per 1,000 square feet of actual nitrogen, 4 percent phosphorus and 2 percent potassium, by weight using the same mix until maintenance period is over.

I. Lawn maintenance by the Contractor shall cease upon receipt of written Notice of Substantial Completion from the Owner's Authorized Representative.

1.10 SUBSTANTIAL COMPLETION

A. The one-year Establishment and Maintenance Period shall begin upon Substantial Completion of the overall project, as determined by the Owner and Project Landscape Architect.

B. The Contractor shall maintain all planted, seeded, and sodded areas in accordance with these specifications until that date, and shall continue such maintenance throughout the one-year

period following project Substantial Completion. All such sod areas shall be maintained and guaranteed as stated in Sections 1.9 & 1.11. **Sodding Contractor shall coordinate with General Contractor to ensure construction sequencing allows adequate time for completion of the Establishment and Maintenance period prior to overall project completion.**

1.11 WARRANTY/GUARANTEE PERIOD

A. Warranty / guarantee the sod for the period indicated below against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, or incidents that are beyond Contractor's control.
   1. Warranty Period for the Lawn Sod is one (1) year from date of the Notice of Substantial Completion.
   2. Replace any damaged sod until acceptance by Owner.
   3. Fill any voids between sod pieces, repairing any eroded areas.
   4. Protect the sod by watering, mowing, controlling insects, and fertilizing.
   5. The contractor shall maintain the sprinkling system installed on the project and if there is an existing system he shall maintain it under the direct supervision of the owner.
   6. Advise Owner of any maintenance or watering procedures necessary to care for and promote plant life. All sod must be in satisfactory condition at the time of the substantial completion inspection.
   7. Contractor shall provide specific maintenance instructions to be followed by the owner, including frequency and amount of water to be applied, any special care instructions, etc. These instructions shall be submitted to and reviewed by the Landscape Architect. If the contractor does not provide specific care information, owner will maintain plantings to their best practice and standards and this will be deemed acceptable compliance for any warranty claim.

PART 2 - PRODUCTS

2.1 KENTUCKY BLUEGRASS TURF SOD

A. Kentucky Bluegrass Turf Sod: shall be a Kentucky Bluegrass mix developed for disease resistance and drought tolerance. Sod shall be certified, approved, Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Submit supplier’s certification and seed mix information for approval prior to delivery to the site.

B. Additional Turfgrass sod requirements

   1. Only sod that has been grown on a commercial sod farm shall be used.
   2. Sod shall be of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.
   3. Superior sod grown from certified, high quality, seed of known origin or from plantings of certified grass seedlings or stolons.
   4. Assure over-all high quality and freedom from noxious weeds or an excessive amount of other crop and weedy plants at time of harvest.
   5. Sod shall be machine cut at a uniform soil thickness of three-quarters inch (3/4") at the time of cutting. Measurement for thickness shall exclude top growth and thatch.

Individual pieces of sod shall be cut to the supplier's standard width and length. Maximum allowable deviation from standard widths and lengths shall be five percent 5%). Broken pads and torn or uneven ends will not be acceptable. Sod shall be at least one year old from time of original seeding.

6. Sod shall be harvested, delivered and installed within a period of 24 hours. Soil on sod pads shall be kept moist at all times.
7. Stakes: Stakes for pegging the sod shall be sound hardwood approximately one inch by two inches (1" x 2") and of sufficient length to penetrate the mat, the seed bed and to a minimum depth of two inches (2") of subsoil. Stakes shall be free from insects and fungi and capable of remaining in the ground at least two years.

2.2 FERTILIZER

A. Sustane 4-6-4 Natural Fertilizer mixture for first fertilizer application prior to sodding.

B. Commercial Fertilizer: Commercial-grade complete fertilizer, O-F-241C, type 1, grade 16-16-16, level B with guaranteed chemical analysis of contents marked on the containers.

2.3 MISCELLANEOUS PRODUCTS

A. Herbicide:

1. Provide non-selective post emergent herbicide for use in weed control. Provide Round-up or approved equal.
2. Provide pre-emergent herbicide for use in planter beds for weed control. Provide Treflan or approved equal.

B. Pesticide:

1. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
3. Uniformly moisten excessively dry soil that is not workable or which is dusty.

3.2 PREPARATION

A. Protection

1. Take care in preparation work to avoid conditions which will create hazards. Post signs or barriers as required.
2. Provide adequate means for protection from damage through excessive erosion, flooding, heavy rains, etc. Repair or replace damaged areas.
3. Keep site well drained and landscape excavations dry.

B. Surface Preparation – Newly Graded Subgrades

1. Limit lawn subgrade preparation to areas to be planted.
2. Herbicide Treatment: All sod beds shall be weed free prior to commencing soil placement, fine grading, and planting. Treat areas with a non-selective herbicide as necessary to insure weed free planting areas. Herbicide applications shall be applied in accordance with manufacturer's recommendations and in accordance with section 3.4 Herbicide Application and Weed Control.
3. Provide erosion-control
4. Seven days maximum prior to sodding:
   a. Prepare subgrade and spread Planting Soil Mix in accordance to specification section 329119 – Fine Grading and Soil Preparation.
   b. Reduce elevation of planting soil to allow for soil thickness of sod.
5. After lawn areas have been prepared, take no heavy objects over them except lawn rollers.
6. After preparation of lawn areas and with topsoil in semi-dry condition, roll lawn planting areas in two directions at approximately right angles with water ballast roller weighing 100 to 300 lbs. according to soil type.
7. Rake or scarify and cut or fill irregularities that develop as required until area is true and uniform, free from lumps, depressions, and irregularities.

C. Surface Preparation – Unchanged Subgrades

1. Limit lawn subgrade preparation to areas to be planted.
2. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
3. Loosen surface soil to a depth of at least 4 inches. Till soil to a homogeneous mixture of fine texture and break up all clods and lumps.
4. Remove stones larger than 3/4 inch in any dimension and clods, weeds, sticks, roots, and other extraneous matter and legally dispose them off of the Owner's property.

D. Finish Grading

1. Finish grades shall be in accordance with specification section 329119– Fine Grading and Soil Preparation. Adjustments of finish grades shall be made at the direction of the Landscape Architect as required. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future.
2. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
3. Restore areas if eroded or otherwise disturbed after finish grading and before planting.
4. Final grade of soil in all turf areas shall be as required to allow the finished grade of top of sod (sod crown not including grass blades) to be 1" below top of adjacent pavement.

5. No sodding shall be done immediately after a rain storm or if a prepared surface has been compacted without first loosening the surface to a smooth, loose, uniformly fine texture just prior to sodding.
6. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
7. Before planting, obtain Project Manger's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.3 INSTALLATION

A. Laying of Sod

1. Prior to laying sod, apply Sustane 4-6-fertilizer to the entire surface to receive sod at the rate of 4 pounds per 1,000 square feet.
2. Apply other fertilizers and amendments in quantities necessary for suitable lawn growth as recommended by Soil Test Reports required by Specification Section 329119 Fine Grading and Soil Preparations.
3. Lay sod during growing season. Sodding during dry summer period, at freezing temperatures, or over frozen soil is not acceptable.
4. Lay sod within 24 hours of harvesting.
5. Lay sod to form a solid mass with tightly fitted joints, Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Cut out irregular or thin sections with a sharp knife. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
6. Lay sod flush with adjoining existing sodded surfaces.
7. Lay sod at sloping areas with the long dimension of individual sod strips laid parallel with the contours of the slope.
8. Anchor sod on slopes exceeding 6:1 with wood pegs or steel staples spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.
9. Do not sod slopes steeper than 3:1.

B. After Sodding Is Complete

1. Roll horizontal surface areas in two directions perpendicular to each other.
2. Repair and re-roll areas with depressions, lumps, or other irregularities. Heavy rolling to correct irregularities in grade will not be permitted.
3. Saturate sod with fine water spray within two hours of planting to obtain moisture penetration through sod into top 2” of topsoil.
4. During first two weeks, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 2 inches.
5. Fertilize Kentucky Bluegrass every 21 days following initial application with a 16-16-16 fertilizer. Apply at a rate of one pound per 1,000 square feet of actual nitrogen, 4 percent phosphorus, and 2 percent potassium by weight using the same mix until maintenance period is over.
6. Fertilize Warm Season Turf Grass sod as recommended by sod manufacture.

3.4 TOP DRESSING

A. All areas which are sodded shall be top dressed with the top dressing specified above during or at the end of the establishment period to fill in noticeable gaps between seams. The top dressing shall be first applied by spreading it over the sod and then carefully working it into the joints with a stiff brush or mat.

B. All sodded areas shall be thoroughly watered after the top dressing is applied. Watering must be done carefully so as to avoid puddling or washing. Further work shall be curtailed until the area is dried sufficiently to allow sodding continuance without damage to already laid sod or the prepared bed.

3.5 TURF RENOVATION

A. Renovate existing turf where indicated.

B. Renovate turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.

1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
2. Install new planting soil as required.

C. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.

D. Remove topsoil containing foreign materials, such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.

E. Mow, dethatch, core aerate, and rake existing turf.

F. Remove weeds before sodding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

G. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off owner's property.

H. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.

I. Apply soil amendments and initial fertilizer required for establishing new turf and mix thoroughly into top 4 inches of existing soil. Install new planting soil to fill low spots and meet finish grades.

J. Water newly planted areas and keep moist until new turf is established.

3.6 INSPECTION

A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, re-grade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of sod. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Sufficiently water turf with fine spray to establish sod. After establishment water at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.
3. The Contractor shall submit a watering schedule to the Project Manager.

C. Mow turf as soon as top growth is tall enough to cut, no higher than 3 inches. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

1. Mow Kentucky bluegrass to a height of to 2 inches.

2. Mow Low Water Use Grasses 3-4 inches high or to height recommended by sod supplier. Once established, mowing should only be required monthly at most.

D. Turf Post-fertilization: Apply commercial fertilizer after initial mowing and when grass is dry.

1. Use fertilizer that provides actual nitrogen of at least 1 lb/1000 sq. ft. to turf area.

E. Turf Establishment Service: Provided by skilled employees of landscape Installer. Maintain as required in "Acceptable Turf Establishment," article 3.7. Begin establishment services immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:

1. Sodded Turf: minimum of 30 days from date of planting completion and until date of Final Acceptance.
   a. When initial establishment period has not elapsed before end of planting season, or if turf is not fully established, continue establishment during next planting season.

3.7 ACCEPTABLE TURF ESTABLISHMENT

A. The Contractor shall be responsible for all sodded areas during the Turf Establishment period. The Establishment Period shall begin at the time sodding for the entire project is completed and continues until all turf meets establishment criteria.

B. Turf installations shall meet the following criteria as determined by the Project Manager before Acceptance of Turf and Substantial Completion will be issued in writing:

1. Acceptable Sodded Turf: Turf Establishment shall be achieved when the turf is healthy, well-rooted, even-colored, viable turf, free of weeds, open joints, bare areas, and surface irregularities.
2. No surface soil is visible when grass has been cut to height of 2".
3. Sodded areas have been mowed **a minimum of three times.**
4. Areas sodded after October 1 will be accepted the following spring (May 1st) approximately one month after start of growing season if specified conditions have been met.
5. Reestablish lawns that do not comply with requirements and continue maintenance at not additional cost to the owner until lawns are satisfactory.

C. Use specified materials to reestablish turf that does not comply with requirements, and continue maintenance until turf is satisfactory.

D. Written notice requesting establishment inspection shall be submitted to the Project Manager at least three (3) days prior to the anticipated inspection date.

3.8 HERBICIDE APPLICATION AND WEED CONTROL

A. Application of pre-emergent herbicide is required. The contractor shall maintain the sod weed free until the end of the establishment period.

B. Apply herbicides so no damage to protected vegetation occurs whether inside or outside the project site. Damage to protected vegetation or vegetation outside the project site will be reimbursed to the owner or replaced by the Contractor in a manner satisfactory to the Owner's Authorized Representative, and according to the International Society of Arboriculture Method of "Valuation for Landscape Trees, Shrubs, and Other Plants," latest edition.

C. Post Emergent Herbicide:

1. Mix and apply post-emergent herbicide according to manufacturer's recommendations indicated in the "Weeds Controlled" section of the label, and apply to undesired, actively growing vegetation.

2. Apply the spray mixture so that all undesired vegetation is uniformly covered, but avoid causing over-spray and drift. Spray target vegetation so that it is wet, but short of run-off.

3. Prune all suckers at the base of any trees to the soil level prior to application.

4. Do not apply post-emergent herbicide in any of these conditions: When rainfall is expected within six hours; when there is growth stress as a result of drought, insects, disease, or plant damage, or when there is heavy dust on plants.

5. Do not walk or permit other traffic on treated areas when they are wet from application. Shoes and equipment may track spray solution to areas where vegetation is not to be treated.

6. Repeat application, as necessary to completely eradicate undesired vegetation.

D. Pre-emergent Herbicide:

1. Mix and apply pre-emergent herbicide according to manufacturer's recommendations and information on the side panel, and the following: Use granular applicators designed to apply herbicide at Manufacturer's suggested highest rate.

2. Calibrate the applicator according to the manufacturer's directions prior to use and check frequently during application to be sure the equipment is working properly and distributing the granules uniformly. Do not apply more than the recommended amount.

3. Apply granular herbicide according to manufacturer's recommendations and on site conditions and soil preparation requirements or restrictions appropriate to the herbicide used.

4. The pre-emergent application must be followed within 8 hours with overhead watering or rainfall equivalent to 1/2".

E. License: Use a state licensed applicator to apply herbicide.

F. Mechanical Control:

1. Mechanically control the weeds by pulling, cutting, hoeing, or by any other directed means approved by the Owner's Authorized Representative.

2. Weeds in a dormant stage or other condition which cannot be effectively controlled with post-emergent herbicide shall be removed from the site by mechanical methods.

3.9 CLEANING

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off owner's property.

C. Remove non-degradable erosion-control measures after grass establishment period.

3.10 PROTECTION

A. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

B. Protect sodded areas against traffic or other use immediately after sodding is completed by placing adequate warning signs and barricades.

C. Provide adequate protection of sodded areas against trespassing, erosion, and damage of any kind. Remove this protection after sodded areas have been accepted by Landscape Architect.

3.11 BASIS OF MEASUREMENT AND PAYMENT:

A. Payment for this work shall be by lump sum price listed on the schedule of values as "turf installation."
   1. Payments for materials and labor will be made once the turf establishment period has ended and is determined by the owner in writing to have met all the requirements of this specification.

END OF SECTION 329223

APPENDIX A

MAPLETON
UTAH

SUNRISE
ENGINEERING

Mapleton City – Bike Park

Geotechnical Investigation

January 5, 2026

SUNRISE ENGINEERING

SUNRISE ENGINEERING

Salt Lake City Office
6875 South 900 East, Midvale, Utah 84047 | TEL 801.523.0100 | FAX 801.523.0990

January 5, 2026

Khevar McLeod, E.I.T.
Sunrise-Springville Office
1180 North Mountain Springs Parkway
Springville, Utah 84663

Subject: Proposed Bike Park
Geotechnical Investigation
Mapleton, Utah

Khevar,

Enclosed herein is the report for a geotechnical investigation for the above-referenced project. This report presents the results of geotechnical subsurface exploration, engineering analysis, and recommendations for design and construction of the proposed bike park in Mapleton, Utah.

We appreciate the opportunity to provide geotechnical services to you for this project. Should you have any questions about the report, or if we may be of further service in any way, please let us know.

Sincerely,
SUNRISE ENGINEERING, LLC

Prepared by:

Dao Yang, P.E.
Project Engineer/Hydrogeologist

Reviewed by:

Derek Anderson, P.E.
Principal/Division Manager

MAPLETON CITY – BIKE PARK

GEOTECHNICAL INVESTIGATION

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1 INTRODUCTION

Mapleton City has proposed constructing a bike park in Mapleton, Utah. The topographic locale for the project is the southeastern quarter of Section 27, Township 8 South, Range 3 East, Salt Lake Base and Meridian (SLBM), as shown in **Figure 1**. This report presents a summary of the geotechnical investigation for the proposed bike park project.

1.1 Objectives

The objectives of the geotechnical investigation were to:

- Evaluate subsurface soil/rock and groundwater conditions within the project area, and
- Provide appropriate foundation and earthwork recommendations for the proposed construction.

1.2 Scope of Work

The following tasks have been completed:

- Collect and review available geologic and soil data within the project area.
- Excavate eight test pits (TP-1 through TP-8) at the site.
- Perform percolation tests at four locations (Perc TP-1 through Perc TP-4).
- Analyze collected geotechnical data.
- Provide recommendations for design and construction of the proposed structures.

2 PROPOSED CONSTRUCTION

A bike park will be constructed which includes a trailhead, park entry plaza, parking area (90 spaces), multiuse flex space and picnic area, beginner-intermediate pump track, intermediate-expert pump track, progressive dirt jumps and an elevated mountain bike hub & start mound. Two-foot-high rockery walls will be required for the construction of the parking area.

3 SITE INVESTIGATION

3.1 General Geology

According to Constenius and others (2011), the project site is underlain by the Quaternary lacustrine sand deposits (upper Pleistocene). The formation consists of sand and some silt and gravel deposited in beaches, typically in two settings that correspond to transgressive and regressive phases of Lake Bonneville: (1) deposited below the Provo shoreline while the lake was at and regressing from (below) this shoreline, possibly as parts of deltas from several canyons, grading downslope into fine-grained lacustrine deposits; and (2) deposited between the Provo and Bonneville shorelines of Lake Bonneville as the lake transgressed to and was at the Bonneville shoreline. The thickness of the formation is up to 200 feet.

3.2 Test Pit Excavation and Subsurface Conditions

Fieldwork was conducted on December 4, 2025, and eight test pits (TP-1 through TP-8) were excavated using a backhoe. Test pit locations are shown in **Figure 2**. In-situ soil classification was performed based on soil samples collected during test pit excavation and observation of test pit walls in accordance with the unified

soil classification system. Selected samples were delivered to a geotechnical laboratory for analysis of gradation and Atterberg limits. The laboratory report is provided in **Appendix A**. **Table 1** summarizes the soil and groundwater conditions at the test pit locations.

Table 1: Soil and Groundwater Conditions at Test Pit Locations

Test Pit #	Description	Total Depth	Groundwater
1	0-3': Gravelly fill (GM); 3-5': original topsoil, clay loam with roots; and 5-8' (CL): cemented clayey gravel (GC).	8'	No groundwater
2	0-1.5': Topsoil consisting of silt and gravel with roots; 1.5-7': cemented silty gravel (GM).	7'	No groundwater
3	0-1': Topsoil consisting of silt and gravel with roots; 1-3': gravel with sand and fines (GM); and 3-7': cemented silty sand with gravel (SM).	7'	No groundwater
4	0-0.5': Topsoil consisting of silt and gravel with roots; 0.5-3': cemented clayey gravel (GC); 3-6': clayey sand with gravel (SM); and 6-7': cemented gravel with sand, fines and cobbles (GM)	7'	No groundwater
5	0-1': Topsoil consisting of silt and gravel with roots; 1-2': a layer of hard clay (CL); and 2-7': cemented silty gravel with sand (GM).	7'	No groundwater
6	0-1': Topsoil consisting of silt and gravel with roots; and 1-7': cemented silty sand with gravel (SM).	7'	No groundwater
7	0-1': Topsoil consisting of silt and gravel with roots; and 1-8': cemented silty gravel with sand and cobbles (GM).	8'	No groundwater
8	0-1': Topsoil consisting of silt and gravel with roots; 1-3': cemented gravel with sand and fines (GM); and 3-7': cemented silty sand with gravel (SM).	7'	No groundwater

Since the original topsoil is buried beneath structural fill in the TP-1 area, if foundations for any structures are located in this area, over-excavation through the original topsoil will be necessary.

Groundwater was not encountered at any of the test pits. Review of well logs at the database administered by Utah Division of Drinking Water indicates that the groundwater level in the area ranges from 140 to 180 feet below ground level.

3.3 Percolation Tests

Percolation tests were performed at Perc TP-1 through Perc TP-4. The field-testing records are provided in **Appendix B,** and the test results are summarized in **Table 2**.

Table 2: Summary of Percolation Test Results

Test Hole Number	Test Hole Depth	Saturation Period (Hr)	Swelling Period (Hr)	Inches Drop Final 30 Min. Period	Final Stabilized Percolation Rate (min/inch)
Perc TP-1	48"	4	4	2-¼"	13.3
Perc TP-2	48'	4	4	1"	30
Perc TP-3	48"	4	4	3-¾"	8
Perc TP-4	36"	4	4	1/8"	240

3.4 Geologic Hazards

3.4.1 Active Fault and Surface Fault Rupture

An active fault is a fault displaying evidence of greater than four inches of displacement along one or more of its traces during Holocene time (about 10,000 years ago to present).

According to the U.S. Geological Survey (2025), the Provo section (Class A) of the Wasatch fault zone runs through the site (see **Figure 3**). The fault section is 59 km long with a slip-rate of 1.0-5.0 mm/year. Since the bike park is not a critical/essential facility, and no residential dwelling or commercial/industrial buildings will be constructed at the park site, a fault trench study is not required for the bike park project.

3.4.2 Landslide/Rock Fall

Landslide or landslip is a geological phenomenon which includes a wide range of ground movement such as rock falls, deep failure of slopes, and shallow debris flows which can occur in offshore, coastal and onshore environments. Although the action of gravity is the primary driving force for a landslide to occur, there are other contributing factors affecting the original slope stability. Typically, pre-conditional factors build up specific sub-surface conditions that make the area/slope prone to failure, whereas the actual landslide often requires a trigger before being released.

According to Elliott and Harty (2010), the project site is in a very low landslide susceptibility zone. The site is not located on a steep slope; therefore, the rock fall potential is low.

3.4.3 Floodplain

A floodplain is flat or nearly flat land adjacent to a stream or river that experiences occasional or periodic flooding. It includes the floodway, which consists of the stream channel and adjacent areas that carry flood flows, and the flood fringe, which are areas covered by the flood that do not experience a strong current. A 100-year flood is calculated to be the level of flood water expected to be equaled or exceeded every 100 years on average. The 100-year flood is more accurately referred to as the 1% flood, since it is a flood that has a 1% chance of being equaled or exceeded in any single year. Based on the expected flood water level, a predicted area of inundation can be mapped.

The Federal Emergency Management Agency (FEMA) website was reviewed for Flood Insurance Rate Maps (FIRMs) which cover the project area. The project site is included in FIRM 49049C0800F (FEMA, 2020). However, the map is not printed, which may indicate the project area has a low flooding risk. Moreover, the bike park site is located in a relatively high spot.

3.4.4 Liquefaction

Liquefaction is a process by which soils below the water table temporarily lose strength and behave as a viscous liquid rather than a solid. The types of soils most susceptible are clay-free deposits of sand and silts, and occasionally gravel. When seismic waves, primarily shear waves, pass through saturated granular layers, they distort the granular structure and cause loosely packed groups of particles to collapse. These collapses increase the pore-water pressure between the soil grains if drainage cannot occur. If the pore-water pressure rises to a level approaching the weight of the overlying soil, the effective stresses between soil grains drops to zero and the granular layer temporarily behaves as a viscous liquid rather than a solid. The liquefaction potential of a soil depends primarily on the looseness of the soil, the amount of cementing or clay between particles, and the amount of drainage restriction. Two conditions must exist for liquefaction to occur: (1) the soil must be susceptible to liquefaction (loose, water-saturated, sandy soil, typically between 0 and 30 feet below the ground surface) and (2) ground shaking must be strong enough to cause susceptible soils to liquefy (Anderson and others, 1994).

According to Anderson and others (1994), the project site is located in a very low liquefaction potential zone. Moreover, groundwater at the site is more than 140 feet below grade. Therefore, liquefaction is not of concern at the site.

4 DESIGN RECOMMENDATIONS

4.1 Site Preparation

Topsoil, manmade fills (where encountered) and soils loosened by construction activities should be removed from the building pad, pavement areas, and concrete flatwork areas prior to foundation excavation and placement of site grading fills. Following stripping, the subgrade should be proof-rolled to a firm, non-yielding condition or 90% of maximum dry density (ASTM D1557).

Soft areas detected during proof-rolling operations should be removed and replaced with structural fill. If soft soils extend more than 1.5 feet deep, stabilization may be required. The use of stabilization should be approved by the geotechnical engineer and would likely consist of over-excavating the area by at least 1.5 feet, placing a geofabric (such as Mirafi 600X)) or geogrid (such as Tensar BX-1100) at the bottom of the excavation over which a stabilizing fill consisting of angular coarse gravel with cobbles is placed up to the design subgrade.

Vegetation and other deleterious materials should be removed from the site. Stripped soils will be unsuitable as structural fill but may be stockpiled for later use in landscaped areas.

4.2 Temporary Excavation and Site Grading

Earthwork will be required to level the construction site. All temporary excavations should conform to regulations of the Occupational Safety and Health Administration (OSHA). Based on the results of the field investigation, the onsite shallow soil may be classified as Type B for the purpose of OSHA classification of earth materials exposed in temporary excavations. With restrictions, Type B soils can generally be excavated

at 1.0:1.0 (horizontal : vertical) for excavations less than 20 feet deep. It is the responsibility of the contractor to provide safe working conditions in connection with below grade excavations.

The maximum anticipated depth of trench excavations for utilities conduits is 4 feet. These trench excavations could be made with near-vertical side slopes. Sheeting and shoring should be used whenever required by safety considerations. OSHA regulations do not require that trenches less than 4 feet deep be shored, but deeper trenches should be sheeted and shored in all cases.

4.3 Fill Material

All fill material should be inorganic soils free of vegetation and debris. Fill material should meet the requirements based on the intended use, as summarized in **Table 3**. Compaction requirements are provided in **Table 4**.

Table 3: Fill Material Requirements

Fill Type	Application	Requirements		
		Gradation		Plasticity
		Size	Percent finer by weight	
Structural Fill	Under foundations, concrete slabs or other structural areas	4 inch No. 4 sieve No. 200 sieve	100 35-65 <20	Liquid limit 20 max Plasticity Index 6 max
Site Grading Fill	Fill in non-structural areas and below pavements	4 inch No. 200 sieve	100 <50	Liquid limit 40 max Plasticity Index 10 max
Pipe Zone Backfill	Within utility pipe zone	3/4 inch 3/8 inch No. 4 sieve No. 16 sieve No. 200 sieve	100 78-92 55-67 28-38 7-11	Non-plastic
Trench Backfill	Utility trench backfill above pipe zone	6 inch No. 200 sieve	100 <50	Liquid limit 30 max Plasticity Index 6 max
Aggregate Base Course	Access Road and Parking Area	2 inch 1½ inch 3/4 inch 3/8 inch No. 4 sieve No. 40 sieve No. 200 sieve	100 85-100 70-85 55-75 40-65 15-30 4-10	Non-plastic

Pea gravel or other similar non-cementitious, poorly graded materials should not be used as fill or backfill without prior approval from the geotechnical engineer.

Table 4: Compaction Requirements

Item	Description
Fill Lift Thickness	8 inches or less in loose thickness
Compaction	• 95% of the material's maximum dry density (MDD) per ASTM D1557 below footings, floor slabs and road areas as well as areas with 5 feet or more fill. • 90% of material's MDD per ASTM D1557 in other areas of fill and backfill.
Moisture Content	• near optimum water content (within ±2% of optimum at the time of placement and compaction).

Fill should be tested frequently for moisture content and compaction during placement. Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified compaction is achieved. This may require adjustment of the moisture content.

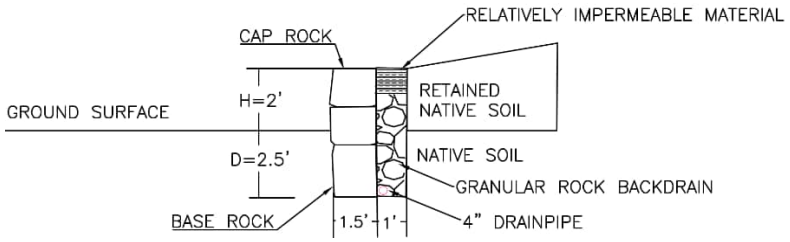
4.4 Permanent Slopes

All final cut and fill slopes should be at least 2.0:1.0 (horizontal : vertical) or retained.

4.5 Rockery

4.5.1 General

A 2-foot-high rockery wall for a parking lot at the proposed bike park shall be constructed as follows:



4.5.2 Rock Requirements

4.5.2.1 General

Rocks to be used for the rockery construction shall consist of hard, angular and durable intact blocks without open fractures, foliation, or other planes of weakness and conform to the following:

(1) Rock has sufficient hardness so that it cannot be scratched with a knife or scratched only with difficulty
(2) Apparent specific gravity, AASHTO T 85 — 2.5 min.
(3) Absorption, AASHTO T 85 — 4.2% max.
(4) Los Angeles abrasion, AASHTO T 96 (500 rev) — 40% max.
(5) Coarse durability index, AASHTO T 210 — 50 min.
(6) Sodium sulfate soundness (5 cycles), AASHTO T 104 — 10% max.
(7) Freeze-thaw loss (12 cycles), AASHTO T 103 — 10% max.

4.5.2.2 Sizes and Shape

The angular rocks shall be generally cubical, tabular, or rectangular in shape and conform to the following:

(1) The minimum rock length is shown in the illustration of Section 4.5.1.
(2) Rock width and height are greater than or equal to one-third of the rock length.
(3) The minimum rock dimension is 18 inches.
(4) The minimum weight of the cap rock (the uppermost rock in the rockery section) is 200 pounds.

4.5.3 Rock Placement

Place the first course of rock (base rock) on firm, unyielding soil or bedrock with full contact between the rock and the subgrade. Excavate any loose, soft or otherwise unsuitable material present at foundation grade and replace with foundation fill as shown in the plans. Compact the foundation fill according to Section 4.3. As the rockery is constructed, place the rocks so that there are no continuous joints in either the vertical or lateral direction.

Stockpile a sufficient number of rocks to provide a good selection for placement. To obtain better fit, place rocks which do not match the spaces offered by the previous course in a different location. Avoid placing rocks which have shapes that create voids with a linear dimension greater than 12 inches.

Except in isolated cases, place each rock so that it bears on at least two rocks below it. Locate at least one bearing point a distance no greater than 6 inches from the average face of the rockery.

The allowable tolerance for base rock widths is 6 inches; however, do not place two or more consecutive base rocks with a width less than 12 inches.

Slope the top surface of each rock towards the back of the rockery at an inclination of at least five (5) percent.

The minimum rockery thickness is based on minimum base rock width, as specified in the illustration in Section 4.5.1, and allowable face batter.

Securely place facing rocks so that the rocks are unable to be moved with a pry bar after the rockery is complete.

4.5.4 Voids

Where voids with a minimum dimension of 6 inches or greater exist in the face of the rockery, chink the voids with smaller rock.

(1) If there is no rock contact within the rockery thickness, chink the void with a smaller piece of rock.
(2) Chinking rocks do not provide primary structural support for the overlying rock.

(3) Chinking rocks cannot be moved or removed by hand after rockery is complete. Reset loose chinking rocks until securely placed or grouted in place. Do not allow grout to be readily visible from the face of the rockery.

4.5.5 Rockery Drainage

Install the granular rock backdrain between the rockery and the back cut face being supported. The granular rock backdrain layer should be at least 12 inches thick, measured horizontally from the back of the base rock to the face of the back cut. Place granular rock backdrain concurrent with the rockery so that at no time is either more than 24 inches higher than the other.

(1) Separate the crushed rock from the back cut by Type 1-B non-woven geotextile. Overlap the non-woven geotextile at least 12 inches at all seams.
(2) Place a 4-inch diameter perforated drainpipe. Surround the pipe on all sides by at least 4 inches of permeable backfill.
(3) Connect the perforated drainpipe to a non-perforated collector pipe at a spacing not to exceed 100 feet center-to-center. Connect the collector pipe to a controlled drain outlet, such as a storm drain, or outlet to a slope using a riprap apron.
(4) Do not connect collector pipes to systems designed for storm water retention in accordance with Best Management Practices design unless approved by the Engineer.
(5) Cap the granular rock backdrain with at least 12 inches of native, relatively impermeable soil. Place non-woven geotextile between the soil cover and the granular rock backdrain.

The granular rock backdrain shall conform to the requirements in **Table 5**.

Table 5: Granular Rock Backdrain Gradation

Opening or Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T27 or T11)
150 mm (6")	100
100 mm (4")	0-25
19 mm (¾")	0-15
4.75 mm (No. 4)	0-5
75 µm (No. 200)	0-2

4.6 Foundations

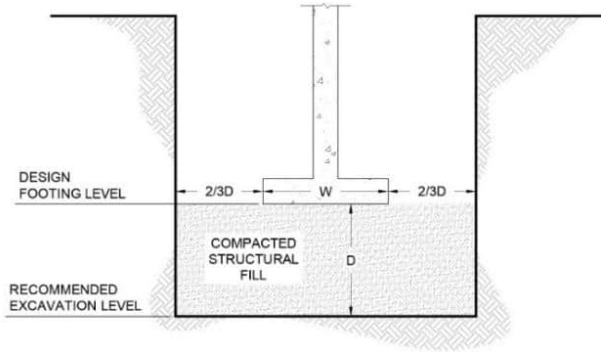
4.6.1 Footings

Based on the onsite soil conditions, the proposed structures should be constructed on spread footings. Footings should not be installed on loose or disturbed soils, undocumented fill, topsoil, construction debris, frozen soil, or within ponded water. If unsuitable soils are encountered, they should be over-excavated and replaced with structural fill. If necessary, structural fill should be placed below footings to level the ground and should extend laterally beyond the edges of the foundation.

If necessary, **at least one feet** of structural fill should be placed beneath footings up to the foundation elevation for any structures if the subgrade at/beneath the foundation does not meet the structural fill

description in **Table 3**. Structural fill placed below footings should extend laterally beyond the edges of the foundation. Prior to placement of structural fill, if required, proof-rolling of previously stripped subgrade should be completed (see Section 4.2). Compaction of the structural fill should follow the recommendations described in Section 4.3.

The over-excavation and backfill procedure is illustrated in the following diagram:



OVEREXCAVATION / BACKFILL (NOT TO SCALE)

If the exposed soils on which the footings are to be founded become loose or disturbed, they should be re-compacted before concrete is placed.

4.6.2 Design Criteria

Based on the available data and in compliance with applicable building codes, the recommended design parameters for footings are summarized in **Table 6**.

Table 6: Design Criteria

Bearing Capacity (Net Allowable Bearing Pressure)	
Continuous (wall) footings	2,000 pounds per square foot (psf)
Isolated columns	2,000 psf
Increase above value for short, transient loads by	30%
Exterior footing frost depth	30 inches
Total allowable settlement	< 1 inch
Estimated differential settlement	<½ inch
Coefficient of subgrade reaction, k_1[1]	200 pounds per cubic inch (pci)
Coefficient of structural fill reaction, k_1[1]	300 pounds per cubic inch (pci)
Density of subgrade	110-125 pcf
Density of structural fill	130 pcf
Note 1: This value is representative of a 1-foot by 1-foot footing and should be scaled appropriately for a larger foundation. The coefficient decreases as the width of the foundation increases. The following equations may be used to scale the coefficient of subgrade reaction: $k = k_1(\frac{B+1}{2B})^2$ for structural fill Where, k = scaled coefficient of subgrade reaction and B = foundation width.	

4.6.3 Lateral Pressure

Excavation walls and retaining walls will be subjected to horizontal loads from the lateral earth pressure of backfill. When granular fill is lightly compacted, drained, and the surface of the soil slope behind a wall is horizontal, the backfill may be considered equivalent to a fluid with a density of 35 pounds per cubic foot (pcf) for active pressure and 55 pcf for at-rest pressure.

4.6.4 Lateral Resistance

Resistance to lateral loads at the bottom of the footings can be calculated based on a coefficient of friction of 0.3. Passive resistance provided by properly placed and compacted granular structural fill above the water table may be considered equivalent to a fluid with a density of 250 pcf. Note that fill against the sides of footings should be placed and compacted to at least 90% of maximum dry density as indicated in Section 4.3 (Fill Material).

4.6.5 Drainage

Drainage design should provide for rapid removal of water from foundation soils and pavement materials, both during and after construction. Drainage design should provide for intercepting water and directing it away from cut and fill slopes.

4.6.6 Cement Type

Four shallow soil samples were collected at approximately three feet below grade from test pits TP-3, TP-4, TP-6 and TP-7 during the subsurface investigation. The samples were delivered under proper chain-of-custody protocols to a laboratory for sulfate analysis. The laboratory results for the samples indicate sulfate concentrations below 10 mg/kg of dry soil (**Appendix C**). Based on the laboratory results, cement would be subject to a mild sulfate attack at the site. Therefore, cement Type I/II is recommended for project construction.

4.6.7 Pavement Recommendations

A pavement design has been prepared for flexible onsite pavement based on design ESALs of 5,000. Other pavement design assumptions consist of an average CBR value of 20 for the onsite subgrade, the pavement design life of 20 years at 80% reliability, standard deviation of 0.35, and Initial and Terminal serviceability indices of 4.2 and 2.5, respectively. Based on the AASHTO flexible pavement design, pavement recommendations include a 3-inch-thick concrete asphalt surface over a 6-inch-thick base course underlain by 6 inches of reworked subgrade.

4.7 Seismic Considerations

4.7.1 Site Class

Based on the data collected from the test pits and the geologic data in the area, the site can be classified as Site Class D (stiff soil) according to International Code Council, Inc. (2021).

4.7.2 Seismic Design Category

The seismic design category for the project site is D.

4.7.3 Seismic Lateral Earth Force

Seismic activity can generate increased lateral earth pressures acting on the foundation walls of the proposed structures. The increase is influenced by horizontal ground acceleration. Based on Mononobe-Okabe procedures for a vertical wall with horizontal backfill, the additional lateral pressures due to earthquake motions were estimated as follows:

$$\Delta P_{ae} = 18.33H^2 \text{ for the walls}$$

Where ΔP_{ae} = seismic lateral pressures in pounds per linear foot (plf) acting at a distance of 0.6*H from the base of the wall, where H is the height of retained soil in feet.

4.7.4 Other Seismic Parameter Values

Other seismic parameter values that may be useful for structural design at the project site are provided as follows:

Parameter	Value (g)	Parameter	Value (g)
S_s	1.37	S_{D1}	0.73
S_1	0.49	S_{M1}	1.09
S_{MS}	1.41	PGA_M	0.58
S_{DS}	0.94		

5 LIMITATIONS

The analyses and recommendations presented in this report are based on the data obtained from the test pits at the indicated locations (**Figure 2**). This report does not reflect variations which may occur in other areas or across the project site. The nature and extent of such variations may not become evident until construction. If variations appear evident, it will be necessary to reevaluate the recommendations of this report.

This report has been prepared for the exclusive use and specific application to the project discussed and has been prepared in accordance with currently accepted geotechnical engineering practices. No warranties, either expressed or implied, are provided. In the event that any changes in the nature, design, or location of the project as outlined in this report are planned, the recommendations contained in this report shall be considered invalid unless the changes are reviewed, and the conclusions of this report modified or verified in writing by the geotechnical engineer.

6 REFERENCES

Anderson, L.R., J.R. Keaton and S.N. Eldredge. 1994. Liquefaction Potential Map for Utah County, Utah: Utah Geological Survey Contract Report 94-3.

Constenius, K.N., D.L. Clark, J.K. King and J.B. Ehler. 2011. Interim Geologic Map of the Provo 30′ X 60′ Quadranle, Utah, Wasatch, and Parts of Salt Lake Counties, Utah: Utah Geological Survey Open-File Report 586DM.

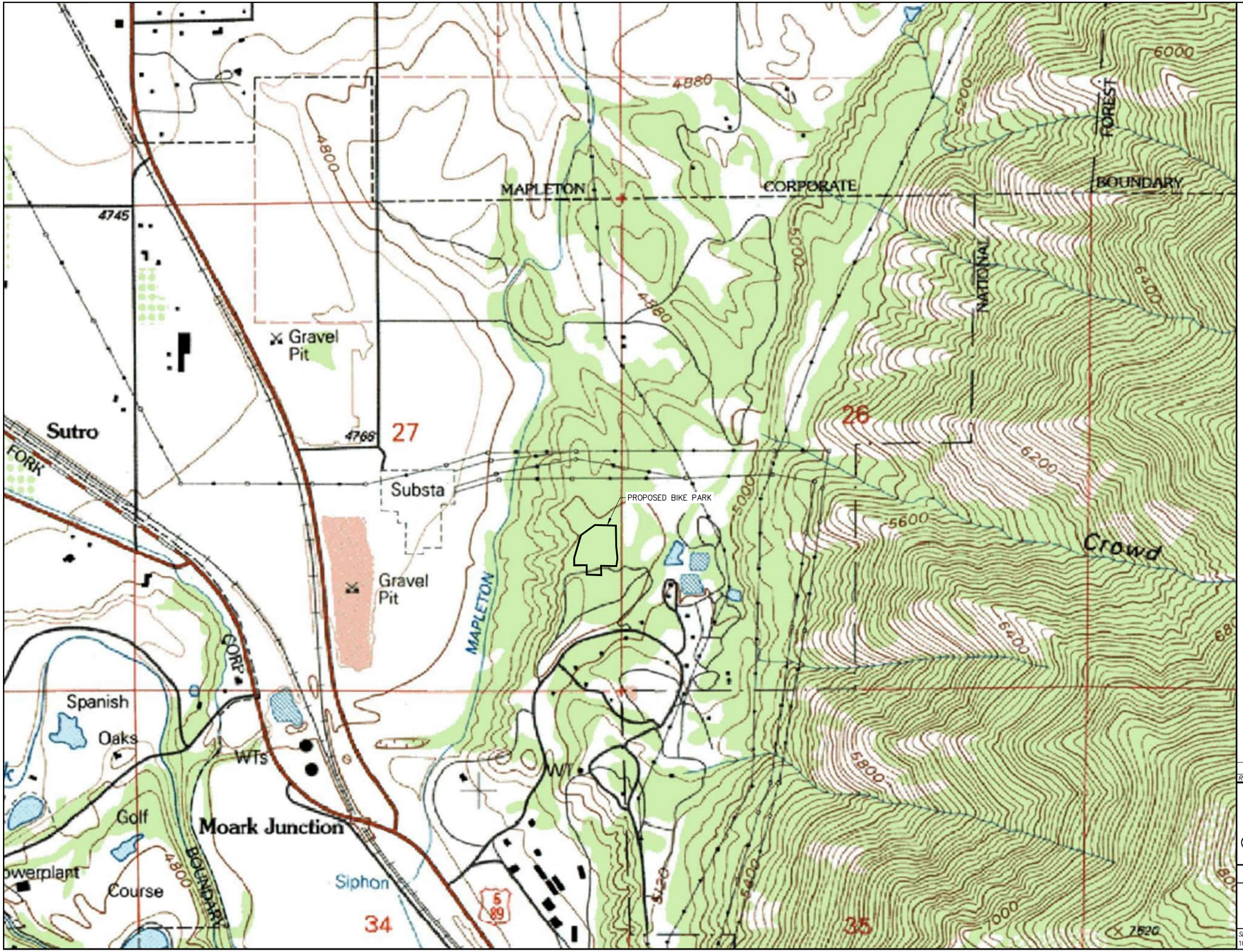
Elliott, A.H. and Harty, K.M. 2010. Landslide Maps of Utah, Provo 30′ X 60′ Quadrangle: Utah Geological Survey Map 246DM.

Federal Emergency Management Agency. 2020. Flood Insurance Map, Utah County, Utah and Incorporated Areas, Utah, Panel 800 of 1450, Map Number 49049C0800F, Effective June 19, 2020.

International Code Council (ICC). 2021. *International Building Code*.

U.S. Geological Survey. 2025. Quaternary Fault Database. Available at https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf. Accessed December 19, 2025.

Figures



NORTH

SCALE

0 500' 1000'

AREA MAP

REV NO.	COMMENT	DATE

FOR REVIEW ONLY
NOT
FOR CONSTRUCTION
DATE

SUNRISE ENGINEERING
6875 SOUTH 900 EAST
SALT LAKE CITY, UTAH 84047
TEL 801.523.0100 FAX 801.523.0990
www.sunrise-eng.com

MAPLETON CITY

BIKE PARK

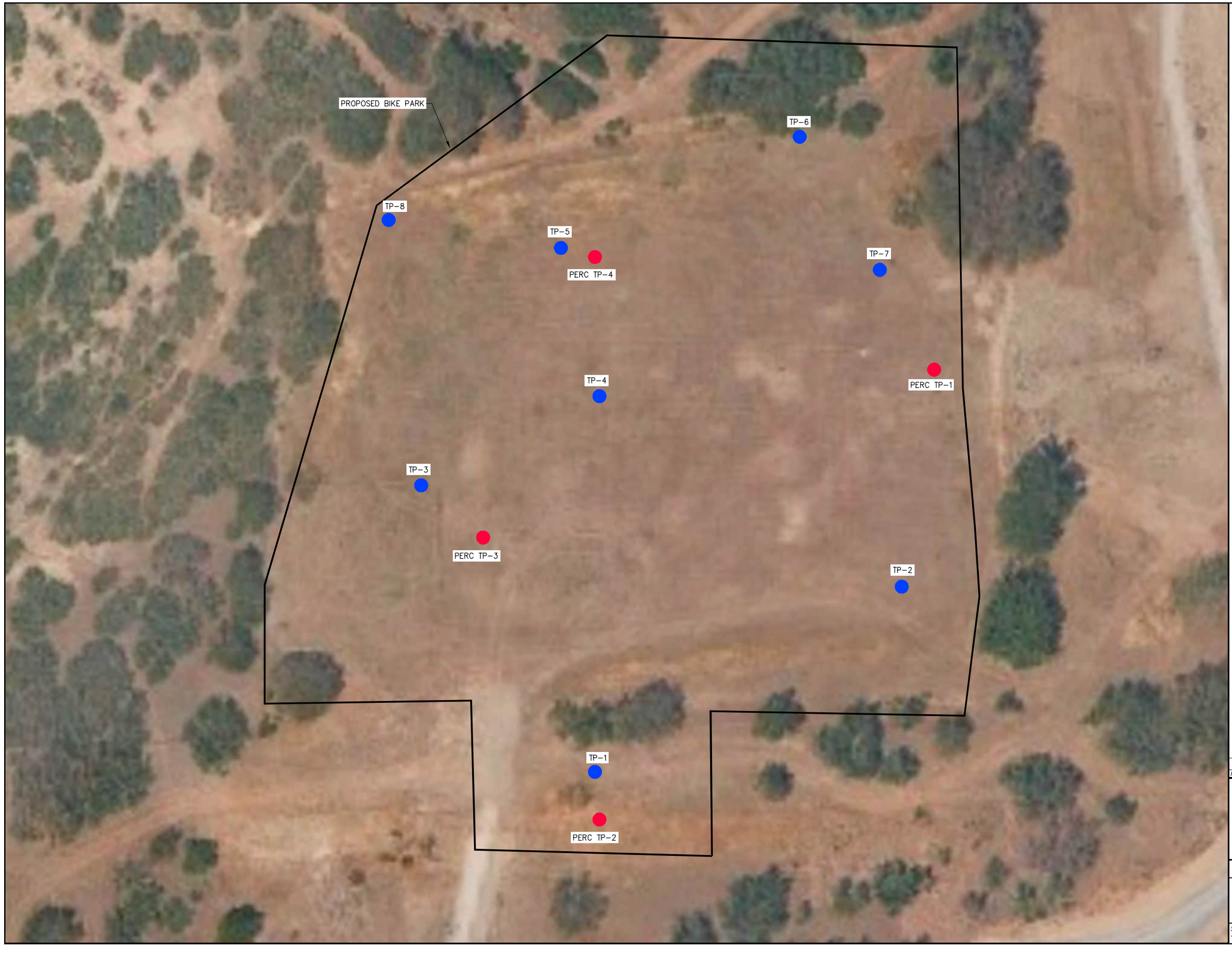
GEOTECHNICAL INVESTIGATION

SITE VICINITY MAP

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
16247	DQY	DQY	DSA	01 of 03

FIG. 1

P:\Mapleton City\16247 Bike Park Project\Design 3D\MapletonGeotech.dwg Dec 22, 2025 11:34am dyang



NORTH

SCALE

0 30' 60'

AREA MAP

REV NO.	COMMENT	DATE

FOR REVIEW ONLY
NOT
FOR CONSTRUCTION
DATE

SUNRISE ENGINEERING
6875 SOUTH 900 EAST
SALT LAKE CITY, UTAH 84047
TEL 801.523.0100 FAX 801.523.0990
www.sunrise-eng.com

MAPLETON CITY

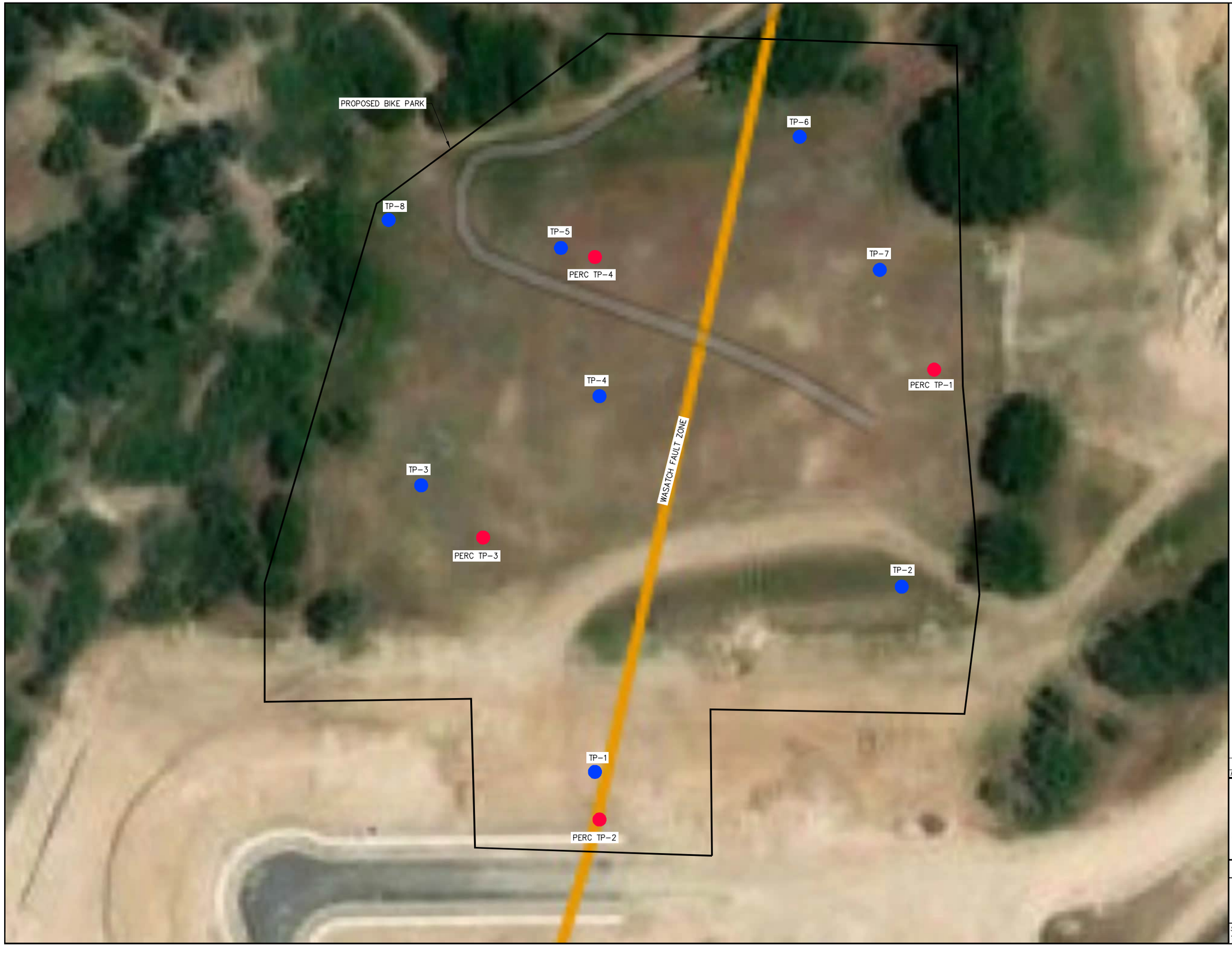
BIKE PARK

GEOTECHNICAL INVESTIGATION

SITE MAP

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
16247	DQY	DQY	DSA	02 of 03	FIG. 2

P:\Mapleton City\16247 Bike Park Project\Design 3D\MapletonGeotech.dwg Dec 22, 2025 11:34am dyang



NORTH

SCALE

0 30' 60'

AREA MAP

REV NO.	COMMENT	DATE

FOR REVIEW ONLY
NOT
FOR CONSTRUCTION
DATE

SUNRISE ENGINEERING
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MAPLETON CITY

BIKE PARK

GEOTECHNICAL INVESTIGATION

ACTIVE FAULT MAP

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
16247	DQY	DQY	DSA	03 of 03

FIG. 3

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Appendix A

Geotechnical Laboratory Results

UTAH TESTING AND ENGINEERING
West Valley City Office
2550 S. Decker Lake Blvd. #17
West Valley City, UT 84119
Phone: 801-838-8250

Sieve Analysis and Atterberg Limits

Report #: 11-000064-01

Client:
Dao Yang - Sunrise Engineering
6875 S 900 E
Midvale, UT 84047

Project:
000726
MSA Geotechnical Testing
6875 S 900 E
Midvale, UT 84047

Location Details: Mapleton Bike Trail Park, 16247

Sample Date: 12/05/2025

Sample Number: 3276

Boring Number: TP-1

Depth (ft): 8

Plastic Limit: 16

Plasticity Index: 10

Gradation		
Sieve	**% Passing**	**Spec**
125 mm (5 inch)	100	0 -
100 mm (4 inch)	100	0 -
75 mm (3 inch)	100	0 -
50 mm (2 inch)	100	0 -
37.5 mm (1.5 inch)	95	0 -
25 mm (1 inch)	83	0 -
19 mm (3/4 inch)	71	0 -
12.5 mm (1/2 inch)	63	0 -
9.5 mm (3/8 inch)	59	0 -
4.75 mm (No. 4)	51	0 -
2 mm (No. 10)	44	0 -
1.18 mm (No. 16)	42	0 -
425 µm (No. 40)	40	0 -
300 µm (No. 50)	39	0 -
150 µm (No. 100)	34	0 -
75 µm (No. 200)	21	0 -
Pan	19	0 -

UTAH TESTING AND ENGINEERING
West Valley City Office
2550 S. Decker Lake Blvd. #17
West Valley City, UT 84119
Phone: 801-838-8250

Sieve Analysis and Atterberg Limits

Report #: 11-000066-00

Client:
Dao Yang - Sunrise Engineering
6875 S 900 E
Midvale, UT 84047

Project:
000726
MSA Geotechnical Testing
6875 S 900 E
Midvale, UT 84047

Location Details: Mapleton Bike Trail Park, 16247

Sample Date: 12/05/2025

Sample Number: 3277

Boring Number: TP-3

Depth (ft): 4

Liquid Limit: Non-Plastic

Plastic Limit: Non-Plastic

Plasticity Index: Non-Plastic

Gradation

Sieve	% Passing	Spec
125 mm (5 inch)	100	0 -
100 mm (4 inch)	100	0 -
75 mm (3 inch)	100	0 -
50 mm (2 inch)	100	0 -
37.5 mm (1.5 inch)	100	0 -
25 mm (1 inch)	97	0 -
19 mm (3/4 inch)	95	0 -
12.5 mm (1/2 inch)	92	0 -
9.5 mm (3/8 inch)	90	0 -
4.75 mm (No. 4)	86	0 -
2 mm (No. 10)	84	0 -
1.18 mm (No. 16)	83	0 -
425 µm (No. 40)	79	0 -
300 µm (No. 50)	74	0 -
150 µm (No. 100)	30	0 -
75 µm (No. 200)	10	0 -
Pan	9	0 -

UTAH TESTING AND ENGINEERING
West Valley City Office
2550 S. Decker Lake Blvd. #17
West Valley City, UT 84119
Phone: 801-838-8250

Sieve Analysis and Atterberg Limits

Report #: 11-000067-00

Client:
Dao Yang - Sunrise Engineering
6875 S 900 E
Midvale, UT 84047

Project:
000726
MSA Geotechnical Testing
6875 S 900 E
Midvale, UT 84047

Location Details: Mapleton Bike Trail Park, 16247

Sample Date: 12/05/2025

Sample Number: 3278

Boring Number: TP-4

Depth (ft): 4

Plastic Limit: 20

Plasticity Index: 7

Gradation		
Sieve	**% Passing**	**Spec**
125 mm (5 inch)	100	0 -
100 mm (4 inch)	100	0 -
75 mm (3 inch)	100	0 -
50 mm (2 inch)	100	0 -
37.5 mm (1.5 inch)	100	0 -
25 mm (1 inch)	100	0 -
19 mm (3/4 inch)	98	0 -
12.5 mm (1/2 inch)	90	0 -
9.5 mm (3/8 inch)	86	0 -
4.75 mm (No. 4)	79	0 -
2 mm (No. 10)	73	0 -
1.18 mm (No. 16)	71	0 -
425 µm (No. 40)	69	0 -
300 µm (No. 50)	67	0 -
150 µm (No. 100)	60	0 -
75 µm (No. 200)	37	0 -
Pan	34	0 -

UTAH TESTING AND ENGINEERING
West Valley City Office
2550 S. Decker Lake Blvd. #17
West Valley City, UT 84119
Phone: 801-838-8250

Sieve Analysis and Atterberg Limits

Report #: 11-000068-00

Client:
Dao Yang - Sunrise Engineering
6875 S 900 E
Midvale, UT 84047

Project:
000726
MSA Geotechnical Testing
6875 S 900 E
Midvale, UT 84047

Location Details: Mapleton Bike Trail Park, 16247

Sample Date: 12/05/2025

Sample Number: 3279

Boring Number: TP-5

Depth (ft): 5

Liquid Limit: Non-Plastic

Plastic Limit: Non-Plastic

Plasticity Index: Non-Plastic

Gradation

Sieve	% Passing	Spec
125 mm (5 inch)	100	0 -
100 mm (4 inch)	100	0 -
75 mm (3 inch)	100	0 -
50 mm (2 inch)	100	0 -
37.5 mm (1.5 inch)	100	0 -
25 mm (1 inch)	87	0 -
19 mm (3/4 inch)	76	0 -
12.5 mm (1/2 inch)	71	0 -
9.5 mm (3/8 inch)	66	0 -
4.75 mm (No. 4)	59	0 -
2 mm (No. 10)	54	0 -
1.18 mm (No. 16)	53	0 -
425 µm (No. 40)	51	0 -
300 µm (No. 50)	50	0 -
150 µm (No. 100)	36	0 -
75 µm (No. 200)	20	0 -
Pan	17	0 -

UTAH TESTING AND ENGINEERING
West Valley City Office
2550 S. Decker Lake Blvd. #17
West Valley City, UT 84119
Phone: 801-838-8250

Sieve Analysis and Atterberg Limits

Report #: 11-000070-00

Client:
Dao Yang - Sunrise Engineering
6875 S 900 E
Midvale, UT 84047

Project:
000726
MSA Geotechnical Testing
6875 S 900 E
Midvale, UT 84047

Location Details: Mapleton Bike Trail Park, 16247

Sample Date: 12/05/2025

Sample Number: 3281

Boring Number: TP-8

Depth (ft): 4

Liquid Limit: Non-Plastic

Plastic Limit: Non-Plastic

Plasticity Index: Non-Plastic

Gradation

Sieve	% Passing	Spec
125 mm (5 inch)	100	0 -
100 mm (4 inch)	100	0 -
75 mm (3 inch)	100	0 -
50 mm (2 inch)	100	0 -
37.5 mm (1.5 inch)	100	0 -
25 mm (1 inch)	100	0 -
19 mm (3/4 inch)	100	0 -
12.5 mm (1/2 inch)	93	0 -
9.5 mm (3/8 inch)	92	0 -
4.75 mm (No. 4)	90	0 -
2 mm (No. 10)	88	0 -
1.18 mm (No. 16)	87	0 -
425 µm (No. 40)	86	0 -
300 µm (No. 50)	83	0 -
150 µm (No. 100)	62	0 -
75 µm (No. 200)	34	0 -
Pan	31	0 -

UTAH TESTING AND ENGINEERING
West Valley City Office
2550 S. Decker Lake Blvd. #17
West Valley City, UT 84119
Phone: 801-838-8250

Sieve Analysis and Atterberg Limits

Report #: 11-000069-00

Client:
Dao Yang - Sunrise Engineering
6875 S 900 E
Midvale, UT 84047

Project:
000726
MSA Geotechnical Testing
6875 S 900 E
Midvale, UT 84047

Location Details: Mapleton Bike Trail Park, 16247

Sample Date: 12/05/2025

Sample Number: 3280

Boring Number: TP-6

Depth (ft): 5

Liquid Limit: Non-Plastic

Plastic Limit: Non-Plastic

Plasticity Index: Non-Plastic

Gradation

Sieve	% Passing	Spec
125 mm (5 inch)	100	0 -
100 mm (4 inch)	100	0 -
75 mm (3 inch)	100	0 -
50 mm (2 inch)	100	0 -
37.5 mm (1.5 inch)	100	0 -
25 mm (1 inch)	85	0 -
19 mm (3/4 inch)	78	0 -
12.5 mm (1/2 inch)	68	0 -
9.5 mm (3/8 inch)	63	0 -
4.75 mm (No. 4)	54	0 -
2 mm (No. 10)	49	0 -
1.18 mm (No. 16)	47	0 -
425 µm (No. 40)	46	0 -
300 µm (No. 50)	45	0 -
150 µm (No. 100)	32	0 -
75 µm (No. 200)	18	0 -
Pan	16	0 -

Appendix B

Percolation Test Records

RECORD SHEET FOR CONDUCTING SOIL INFILTRATION TEST

Name of Project or Development: Mapleton Bike Park Date of Test: 12/4/2025

Location of Property: **Bike Park**

Name of Person Performing the Test: **Dao Yang**

Infiltration Test No.: Perc TP-1

Period of time hole was saturated: hours: 4	Time interval used for measuring water drop Minutes	Hole width or diameter: 5'x1.5'
Total Depth of Hole 4'	Period of time soil hours permitted to swell: 4	Depth of water table: >140'

Successive Infiltration Test	Initial Depth to Water	Beginning Time	Final Depth to Water	Ending Time	Water Level Drop	Time Interval (min)	Infiltration Rate (min/inch)
1	26 1/8"	12:58	36 1/8"	13:58	10"	60	6
2	36 1/8"	13:38	39"	14:18	2 7/8"	20	6.96
3	39	14:18	40 ½"	14:38	1 ½"	20	13.3
4	40 ½"	14:38	42"	14:58	1 ½"	20	13.3
5							
6							
7							
8							
9							
10							

Final Stabilized Infiltration Rate: **13.3 minutes/inch**

RECORD SHEET FOR CONDUCTING SOIL INFILTRATION TEST

Name of Project or Development: Mapleton Bike Park Date of Test: 12/4/2025

Location of Property: **Bike Park**

Name of Person Performing the Test: **Dao Yang**

Infiltration Test No.: Perc TP-2

Period of time hole was saturated: hours: 4	Time interval used for measuring water drop Minutes	Hole width or diameter: 5'x1.5'
Total Depth of Hole 4'	Period of time soil hours permitted to swell: 4	Depth of water table: >140'

Successive Infiltration Test	Initial Depth to Water	Beginning Time	Final Depth to Water	Ending Time	Water Level Drop	Time Interval (min)	Infiltration Rate (min/inch)
1	21 ½"	14:12	22 ½"	14:42	1"	30	30
2	22 ½"	14:42	23 ½"	15:12	1"	30	30
3	23 ½"	15:12	24 ½"	15:42	1"	30	30
4							
5							
6							
7							
8							
9							
10							

Final Stabilized Infiltration Rate: **30 minutes/inch**

RECORD SHEET FOR CONDUCTING SOIL INFILTRATION TEST

Name of Project or Development: Mapleton Bike Park Date of Test: 12/4/2025

Location of Property: **Bike Park**

Name of Person Performing the Test: **Dao Yang**

Infiltration Test No.: Perc TP-3

Period of time hole was saturated: hours: 4	Time interval used for measuring water drop Minutes	Hole width or diameter: 5'x1.5'
Total Depth of Hole 4'	Period of time soil hours permitted to swell: 4	Depth of water table: >140'

Successive Infiltration Test	Initial Depth to Water	Beginning Time	Final Depth to Water	Ending Time	Water Level Drop	Time Interval (min)	Infiltration Rate (min/inch)
1	17"	14:06	24 5/8"	14:36	7 5/8"	30	3.93
2	24 5/8"	14:36	29 ½"	15:06	4 7/8"	30	6.15
3	29 ½"	15:06	33 7/8"	15:36	3 ¾"	30	8
4	33 7/8"	15:36	37 5/8"	16:06	3 ¾"	30	8
5							
6							
7							
8							
9							
10							

Final Stabilized Infiltration Rate: **8 minutes/inch**

RECORD SHEET FOR CONDUCTING SOIL INFILTRATION TEST

Name of Project or Development: Mapleton Bike Park Date of Test: 12/4/2025

Location of Property: **Bike Park**

Name of Person Performing the Test: **Dao Yang**

Infiltration Test No.: Perc TP-4

Period of time hole was saturated: hours: 4	Time interval used for measuring water drop Minutes	Hole width or diameter: 5'x1.5'
Total Depth of Hole 3'	Period of time soil hours permitted to swell: 4	Depth of water table: >140'

Successive Infiltration Test	Initial Depth to Water	Beginning Time	Final Depth to Water	Ending Time	Water Level Drop	Time Interval (min)	Infiltration Rate (min/inch)
1	17 ¼"	13:02	17 ¼"	14:32	1"	90	90
2	17 ¼"	14:32	17 ½"	15:32	¼"	60	240
3	17 ½"	15:32	17 ¾"	16:32	¼"	60	240
4							
5							
6							
7							
8							
9							
10							

Final Stabilized Infiltration Rate: **240 minutes/inch**

Appendix C

Chemical Laboratory Results

CHEMTECH-FORD
LABORATORIES

12/18/2025

Work Order: 25L0599
Project: Mapleton Bike Trail Park

Sunrise Engineering Inc. - Midvale
Attn: Dao Yang
6875 South 900 East
Midvale, UT 84047

Client Service Contact: 801.262.7299

The analyses presented on this report were performed in accordance with the National Environmental Laboratory Accreditation Program (NELAP) unless noted in the comments, flags, or case narrative. If the report is to be used for regulatory compliance, it should be presented in its entirety, and not be altered.

NELAP ACCREDITED TNI LABORATORY

Approved By:

Mark Broadhead, Project Manager

Chemtech-Ford Laboratories
Serving the Intermountain West Since 1953

9632 South 500 West
Sandy, UT 84070
O:(801) 262-7299 F: (866) 792-0093
www.ChemtechFord.com

Certificate of Analysis

Sunrise Engineering Inc. - Midvale
Dao Yang
6875 South 900 East
Midvale, UT 84047

PO#: **16247**
Receipt: **12/5/25 12:00 @ 8.1** °C
Date Reported: 12/18/2025
Project Name: **Mapleton Bike Trail Park**

Sample ID: **TP-7 @ 3'**

Matrix: **Solid**
Lab ID: **25L0599-01**
Date Sampled: **12/4/25 11:15**
Sampled By: **Dao Yang**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Sulfate, Soluble (IC)	ND	mg/kg dry	10	EPA 300.0	12/8/25	12/8/25	
Total Solids	95.5	%	0.1	CTF8000	12/5/25	12/5/25	

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Date Reported: 12/18/2025
Project Name: **Mapleton Bike Trail Park**

Sample ID: **TP-6 @ 3'**

Matrix: **Solid**
Lab ID: **25L0599-02**
Date Sampled: **12/4/25 11:40**
Sampled By: **Dao Yang**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Sulfate, Soluble (IC)	ND	mg/kg dry	10	EPA 300.0	12/8/25	12/8/25	
Total Solids	96.5	%	0.1	CTF8000	12/5/25	12/5/25	

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Date Reported: 12/18/2025
Project Name: **Mapleton Bike Trail Park**

Sample ID: **TP-4 @ 3'**
Matrix: **Solid**
Lab ID: **25L0599-03**
Date Sampled: **12/4/25 12:30**
Sampled By: **Dao Yang**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Sulfate, Soluble (IC)	ND	mg/kg dry	11	EPA 300.0	12/8/25	12/8/25	
Total Solids	88.1	%	0.1	CTF8000	12/5/25	12/5/25	

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PO#: **16247**
Receipt: **12/5/25 12:00** @ **8.1** °C
Date Reported: 12/18/2025
Project Name: **Mapleton Bike Trail Park**

Sample ID: **TP-3 @ 3'**

Matrix: **Solid**
Lab ID: **25L0599-04**
Date Sampled: **12/4/25 12:45**
Sampled By: **Dao Yang**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Sulfate, Soluble (IC)	ND	mg/kg dry	11	EPA 300.0	12/8/25	12/8/25	
Total Solids	94.6	%	0.1	CTF8000	12/5/25	12/5/25	

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Dao Yang
6875 South 900 East
Midvale, UT 84047

PO#: **16247**
Receipt: **12/5/25 12:00 @ 8.1** °C
Date Reported: 12/18/2025
Project Name: **Mapleton Bike Trail Park**

Report Footnotes

Abbreviations

ND = Not detected at the corresponding Minimum Reporting Limit (MRL).
1 mg/L = one milligram per liter or 1 mg/kg = one milligram per kilogram = 1 part per million.
1 ug/L = one microgram per liter or 1 ug/kg = one microgram per kilogram = 1 part per billion.
1 ng/L = one nanogram per liter or 1 ng/kg = one nanogram per kilogram = 1 part per trillion.
On calculated parameters, there may be a slight difference between summing the rounded values shown on the report vs the unrounded values used in the calculation.

CHAIN OF CUSTODY - SAMPLE SUBMITTAL FORM

COMPANY: Sunrise Engineering
ADDRESS:
CITY/STATE/ZIP:
PHONE #:
CONTACT: Dao Yang
EMAIL:
PROJECT: Mapleton Bike Trail Park
PO Number: 16247
INVOICE EMAIL ADDRESS:

RUSH Due Date*:	QC Level

* Expedited turnaround subject to additional charge

QC levels definition:
QC1: none (default if blank)
QC2: Batch QC, random sample
QC3: 25% surcharge. Narrative plus Batch QC, your sample selected
QC4: 40% surcharge. Add raw data

CHEMTECH-FORD LABORATORIES

Chemtech-Ford, Inc.
9632 South 500 West
Sandy, UT 84070
Phone: 801-262-7299
www.chemtechford.com

Sample condition				Delivery Method			
	Custody Seal	✓	Correct Containers				
✓	Container Intact	✓	Sufficient Sample Volume		UPS		USPS
✓	COC/Labels Agree		Headspace Present (VOC)		FedEx		Chemtech-Ford Courier
✓	Received on Ice		Temperature Blank		Walk-in		Customer Courier
		✓	Received within Holding Time	✓			

25L0599

Lab Use Only	CLIENT SAMPLE INFORMATION				TESTS REQUESTED: Soil Gate
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	
01	1. TP-7 @ 3'	12/4/25	1115	Soil	X
02	2. TP-6 @ 3'	↓	1140	↓	X
03	3. TP-4 @ 3'		1230		X
04	4. TP-3 @ 3'		1245		X
	5.				
	6.				
	7.				
	8.				
	9.				
	10.				
	Bottle type				1-4 / 402
	Lot #				13552

Sampled by: [print] Dao Yang
Sampled by: [signature] Dao Yang
Special Instructions:

ON ICE NOT ON ICE Temp (C°): 8.1
Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Dao Yang	12/5/25 1200	Arzene Tees	12/5/25 1200
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum). Client agress to pay collection costs and attorney's fees.

APPENDIX B

MAPLETON
UTAH

SUNRISE
ENGINEERING

Taylor Torgersen

From: Taylor Torgersen
Sent: Tuesday, February 3, 2026 11:42 AM
To: Taylor Torgersen
Subject: FW: Here's Your Design Quote (#1765910116539681-1)

From: sales=wrightbuildings.com@idearoom-mail.wrightbuildings.com <sales=wrightbuildings.com@idearoom-mail.wrightbuildings.com> on behalf of Wright Buildings <sales@wrightbuildings.com>
Sent: Tuesday, December 16, 2025 11:37:20 AM
To: Colby North <cnorth@mapleton-ut.gov>
Subject: Here's Your Design Quote (#1765910116539681-1)

Wright Buildings
327 Market Street
Kaysville, Utah 84037
801-787-1949
sales@wrightbuildings.com

Customer Order - **Dec 16, 2025**

Ship To

Name colby North | Order # 1765910116539681-1

Billing Address

City | State | Zip Code

Install Address

City Mapleton | State UT | Zip Code 84664

Email cnorth@mapleton-ut.gov | Phone # 3854470381 | Mobile #

Building Info		Size			Color		Anchoring & Site Preparation	
Style:	Classic	20' Width	X 20' Length	X 12' Eave Height	Roof	Black	Installation Surface:	Ground
Roof Overhang:	12" Overhang				Trim:	Black		

Roof Style:	Metal
Leg Style:	Standard

Siding: Shadow Gray

Design Link & Notes

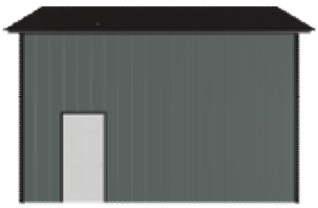
Design Link: https://design.wrightbuildings.com/?lng=en-US#35709d5bd841c3ecd711267a55509e98

Building Images

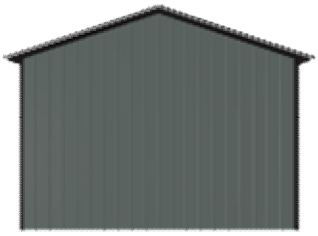
Perspective View

Front

Left Side



Right Side



Back

Section	Description	Quantity	Amount
	Structure Details		
	Style: Classic	1	-
	Base Size: 20‘x20'	1	$14,000.00
	Installation Surface: Ground	2	-
	Siding Color: Shadow Gray	1	-
	Trim: Black	1	-
	Roof: Black	1	-

Section	Description	Quantity	Amount
	Roof Interior: White	1	-
	Generic Color: White	1	-
	Wall Interior Color: White	1	-
	Overhead Doors: Artic White	1	-
	Frame Spacing: 10 Feet	1	-
	Roof Style: Metal	1	-
	Roof Pitch: 4 / 12	1	-
	Roof Overhang: 12" Overhang	1	$2,100.00
	Leg Height: 12'	1	-
	Left Side: Fully Enclosed	1	-
	Left Side Siding: Standard Metal	1	-
	Right Side: Fully Enclosed	1	-
	Right Side Siding: Standard Metal	1	-
	Front End: Fully Enclosed	1	-
	Front End Siding: Standard Metal	1	-
	Back End: Fully Enclosed	1	-
	Back End Siding: Standard Metal	1	-
	Doors & Ramps		
	Standard Fiberglass	1	$500.00
	Garage Doors & Ramps		
	10'x10' Overhead Door - Non-Insulated	1	$2,859.00
	Additional Options		
	Delivery and Installation (Included)		-
	Standard Girts		-

Section	Description	Quantity	Amount
	Additions and Adjustments		
All	light panels 2'	2	$1,600.00
	Additional Fees		
All	* Insulation - No insulation requested	1	-
		Subtotal:	$21,059
		Tax Calculated Based Off Delivery Address:	-
		Total Order Amount:	$21,059
		Deposit Required to Order:	$10,529.50
		Final Balance Due at Installation:	$10,529.50

Signatures	
Customer Signature:	
Date:	
Delivery Date (may vary depending on weather):	
Delivery Notes:	

Dealer or Manufacturer Signature:	
Date:	

This purchase agreement (the "Agreement") is made by and between Wright Buildings, And the Buyer. Buyer agrees to buy, and Wright Buildings agrees to sell, Wright Buildings building products related to the design herein, pursuant to the terms listed in this agreement, the item described above.

ALL WRIGHT BUILDINGS buildings include the following unless otherwise noted:

- Painted-Galvanized 29 gauge steel on roof
- 2x6 Purlins on 16”-24" centers
- 2x6 Girts on 24"-32" centers
- Treated poles rated for direct burial, embedded in concrete and set on 8’ to 12' centers.
- Quality/Highest grade of lumber and steel are used

General things customers need to know:

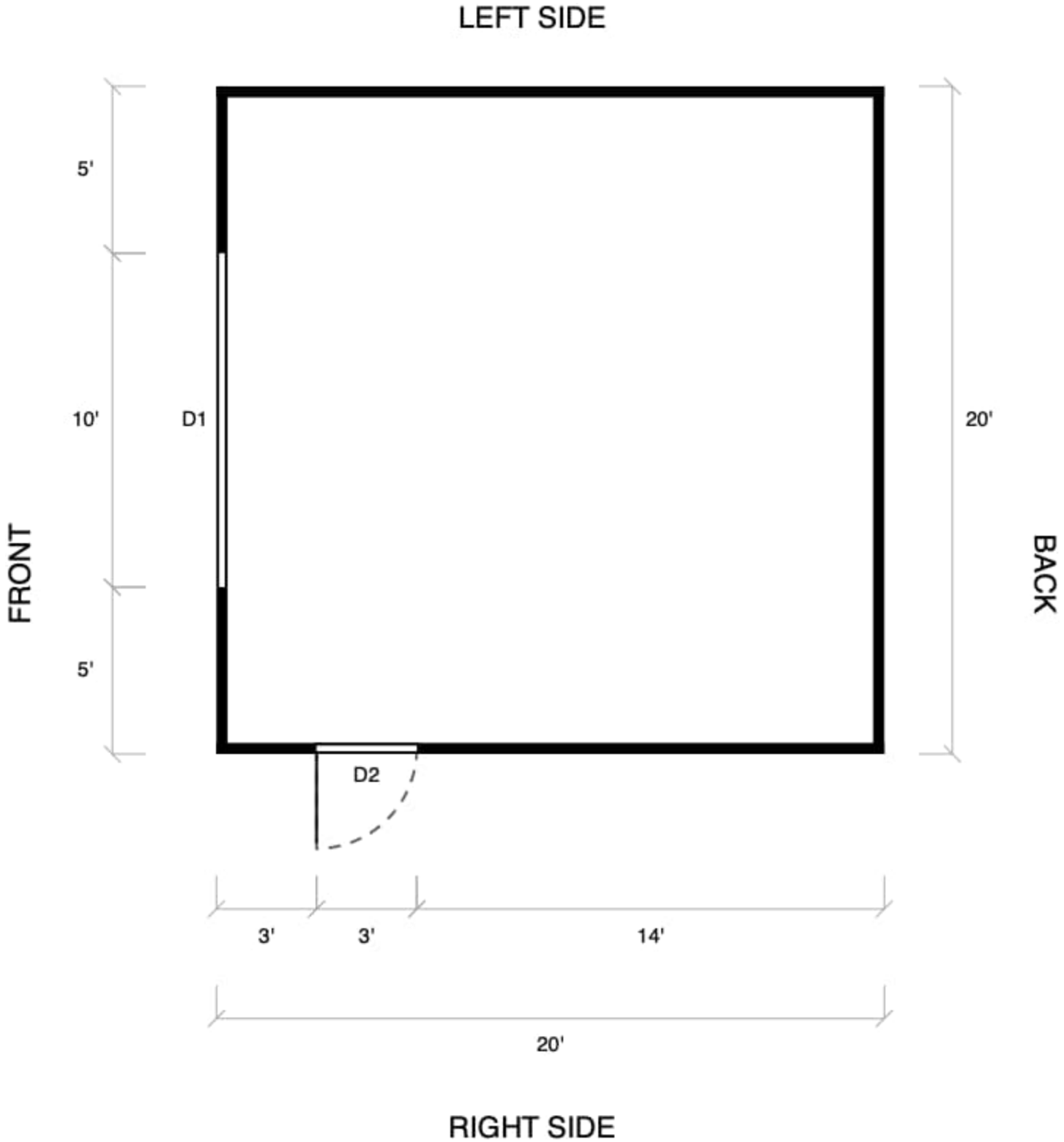
- Site needs to be level.
- Customer is responsible for getting HOA approval if required.
- Customer is responsible for purchasing & picking up Permit from City/County (This is not an included service).
- If post holes cannot be dug with a skid steer and auger, there will be extra cost for a backhoe and extra concrete (holes will be larger if dug with a backhoe).
- Unless noted above, any extra fill material, to bring the site to level and/or under concrete, is the responsibility of the customer.
- All excavation including leveling out the site (beside the digging of the holes) is the responsibility of the customer.
- *The cost of permits will be added if/when Wright Buildings is responsible for obtaining the customers' permit. Prices may vary from City to City (all Cities are different). We can communicate with the City/County, and we will supply all of the plans that are needed for no extra charge.
- *Any utilities that are not marked by Blue Stakes or the utility companies are the responsibility of the owner.
- *Typical payment schedules are 50 percent up front, 25 percent when poles are set and 25 percent when the job is finished. Final payment is due within 5 days of project completion.

Pricing Table (For Internal Use): - Default Price Book

Wright Buildings
327 Market Street
Kaysville, Utah, 84037
801-787-1949
sales@wrightbuildings.com

FLOOR PLAN


WRIGHT
BUILDINGS


LEFT SIDE
5'
10'
5'
FRONT
D1
20'
BACK
D2
3'
3'
14'
20'
RIGHT SIDE

SYMBOL LEGEND

10'x10' Overhead Door - Non-Insulated