



WEST VALLEY CITY

Parks & Recreation

Sunset Hills Park Site Improvement Project

**6420 South Oquirrh Mesa Drive
West Valley City, UT 84081**

WVC-PR-P006

**Prepared By
West Valley City Parks and Recreation Department**

West Valley Parks and Recreation
3600 South Constitution Blvd.
West Valley City, Utah 84119

PROJECT: Sunset Hills Park

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BIDDING REQUIREMENTS

DOCUMENT 00 1116

INVITATION TO BID

PART 1 GENERAL

1.1 CONSTRUCTION CONTRACT

- A. Bidders are invited to Bid on a Construction Contract known as the *Sunset Hills Park – Site Improvements Project*.
- B. For information about the award of this Construction Contract contact *Jason Erekson*, West Valley City, Telephone (801) *955-4006*.

1.2 DESCRIPTION OF WORK

- A. Location of Work: *6420 South Oquirrh Mesa Dr., West Valley City, Utah 84081*.
- B. Scope of Work: Contractor will be responsible for all labor, materials, equipment, coordination and incidentals necessary to complete work as described in the Contract Documents. The work to be performed generally includes, but is not limited to the following:
 - 1. The complete construction of a new city neighborhood park Includes site clearing and grubbing, excavation and earth work, rough grading, top soil screening, irrigation system installation with controller, top soil placement, finish grading, sod/hydro-seed/drill seed turf, trees, shrubs, groundcover, concrete flatwork, concrete curbing, concrete retaining walls, pre-fabricated pavilion installation, playground installation, impact material installation, drainage system installation, lights and light piers, electrical system, electrical service, drinking fountain and park sign.
 - 2. Other work normally encountered during construction on improved and unimproved properties.

1.3 BIDDERS' PRE-QUALIFICATION

- A. Bidders are not required to be pre-qualified for this project.

1.4 BASIS OF BIDS

- A. Bids shall be on a lump sum basis. Unsealed or segregated Bids will not be accepted. Bidders shall comply with all Instructions to Bidders.

1.5 CONTRACT TIME

- A. The work will be substantially completed in **ninety (90) calendar days** from the date of the Notice to Proceed.

1.6 EXAMINATION AND PROCUREMENT OF DOCUMENTS

- A. Complete sets of Contract Documents may be examined and obtained beginning January 23, 2023 from the ENGINEER. Plan sets can be downloaded from a third party website and can be located via the West Valley City Engineering Division website, www.wvc-ut.gov/engineering.
- B. Copies of **2017 version of APWA Manual of Standard Drawings and Specifications** may be obtained for a cost of sixty-five dollars (\$65.00). Go to <http://utah.apwa.net/> for purchase information.

1.7 PRE-BID CONFERENCE

- A. A pre-bid conference **will be held** on January 26, 2023 at **10:00 am in the Family Fitness Center, Community Room A, which is located at 5415 West 3100 South, West Valley City, Utah**. All contractors intending on submitting a bid are invited to attend so they can obtain relevant information concerning the project. Bidders are advised that information affecting drawings, specifications, conditions, Scope of Work, etc. may be discussed. OWNER assumes no obligation to disclose information discussed at the pre-bid conference to Bidders who do not attend. Absent Bidders assume all risk of failure to attend.

1.8 BID SECURITY

- A. Bid Security in the amount of at least five percent (5%) of the Bid must accompany each Bid in accordance with the Instructions to Bidders. Bid Security will be returned to each unsuccessful Bidder after tabulation and award of the Construction Contract.

1.9 BID LOCATION AND OPENING

- A. Sealed Bids will be received at:
The Office of the City Recorder
3600 South Constitution Blvd.
Room 140
West Valley City, Utah 84119

until **11:00 am Mountain Standard time**, as conclusively established by the clock at the bid opening location, **on February 15, 2023**. Bids received after the indicated time will not be accepted. Bids will be publicly opened in the City Council Chambers, 3600 South Constitution Blvd., West Valley City, Utah 84119 at approximately **11:05 am** local time by an authorized City official.

- B. On the outside of the envelope, the Bidder shall indicate the Construction Contract title, the name and address of the Bidder and the date and time of the Bid opening.

1.10 RIGHT TO REJECT BIDS

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

1.11 VALIDITY PERIOD FOR BIDS

- A. Bids shall remain valid for 45 days after the day of Bid opening. Bidders who withdraw their Bid after the Bid opening, but before expiration of said period, shall forfeit their Bid Security if Notice of Intent to Award to Bidder is made by OWNER.

1.12 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.

1.13 EMPLOYMENT STATUS VERIFICATION SYSTEM REQUIREMENTS

- A. The Contractor shall present evidence to the City of participation in an approved Status Verification System prior to execution of this Agreement.

END OF DOCUMENT 00 11 16

DOCUMENT 00 2113

INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.1 DEFINED TERMS

- A. Terms used in the Bid documents, which are defined in Article 1.1 of the General Conditions, will have the meanings indicated in the General Conditions. General Conditions: as published in Document 00 72 00 in the 2017 Edition Manual of Standard Specifications by the Utah Chapter of the American Public Works Association.

1.2 COPIES OF BID DOCUMENTS

- A. Complete sets of Bid Documents must be used 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 Bidder 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. All provisions of the 2017 Manual of Standard Specifications and 2017 Manual of Standard Plans published by the Utah Chapter of the American Public Works Association, which are applicable to the work, are made a part of the Contract Documents by reference. The publications may be purchased separately from West Valley City, 3600 South Constitution Blvd. (2700 W.), Room 280, West Valley City, Utah 84119. Costs are \$30.00 for the specifications and \$25.00 for the plans (or \$55.00 for the set).

1.3 PRE-BID CONFERENCE

- A. A pre-Bid conference ***will be held at 10:00 AM*** on Thursday January 26, 2023, at ***the Family Fitness Center 5415 West 3100 South, Community Room "A"***, West Valley City, Utah. All contractors intending to submit a bid are invited to attend to obtain relevant information concerning the project. Bidders are advised that information affecting drawings, specifications, conditions, scope of work, etc. may be discussed. OWNER, assumes no obligation to disclose information discussed at the pre-bid conference to Bidders who do not attend. Absent Bidders assume all risk of failure to attend.

1.4 EXAMINATION OF SITE AND CONTRACT DOCUMENTS

- A. In General: Bidders are permitted to converse with ENGINEER'S personnel having knowledge of the project, plans, specifications, material sites, or conditions generally prevailing in the area of the project to aid in pre-Bid investigations. The OWNER is not bound by any statements or representations made by ENGINEER or ENGINEER'S personnel before the Bid opening or award of the Construction Contract, or for any assumptions or conclusions reached by a prospective Bidder as a result of such communication unless the ENGINEER issues an Addendum to all prospective Bidders.
- B. Access to Site: 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. Contract Documents: The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 1.4; that without exception the Bid is premised upon performing and furnishing the work required by the Contract Documents; and, that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the work.
- D. Bidders' Obligations: The submission of a Bid constitutes acknowledgement that Bidder has complied with all Bidding instructions. It is the responsibility of each 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. Consider federal, state and local laws and regulations that may affect cost, progress, performance or furnishing of the work;
 - 4. Study and carefully correlate Bidder's observations with the Contract Documents; and
 - 5. Identify and notify ENGINEER in writing of all specific conflicts, errors or discrepancies in the Contract Documents, or if Bidder doubts their meanings.

The failure or omission of any Bidder to receive or examine any form, instrument, addendum other document, visit the site and become acquainted with conditions there existing, or attend the pre-Bid conference, shall in no way relieve any Bidder from obligations with respect to Bidder's Bid or to the Construction Contract.

- E. Deviations from the Terms of the Contract Documents: OWNER will not accept any deviations whatsoever from the printed terms of the Agreement (Document 00 52 00) and the Contract Documents, except by Addendum or Change Order.

1.5 PHYSICAL CONDITIONS

- A. In General: Before submitting a Bid, each Bidder will be responsible for review of OWNER'S 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. Surface and Subsurface Conditions: Provisions concerning surface and subsurface conditions, if any, are set forth in the Geotechnical Data (Document 00 31 32). The document provides the identification of:
 - 1. Reports of explorations and tests of subsurface conditions at the site which have been utilized by ENGINEER in preparing the Contract Documents; and
 - 2. Drawings of physical conditions in or relating to existing surface and subsurface structures (except underground facilities) which are at or contiguous to the site and have been utilized by ENGINEER in preparing the Contract Documents.
 - 3. Underground Facilities: Information and data indicated in the Contract Documents regarding underground facilities at or contiguous to the site is based upon information and data furnished to OWNER and ENGINEER by owners of such underground facilities. The OWNER does not assume responsibility for the accuracy or completeness thereof other than as provided in paragraph 4.3A.2 of the General Conditions or unless expressly provided in the Modifications to General Conditions (Document 00 73 03).
 - 4. Additional Explorations: On request in advance, and if possible, 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. Bidder agrees to indemnify and save the OWNER harmless during and after the performance of additional explorations.
 - 5. Modifications to the Contract Documents: Provisions concerning the adequacy of the data furnished for subsurface structures and underground facilities, and the possibility of changes in the documents due to differing conditions appear in Articles 4.2 and 4.3 of the General Conditions.

PART 2 BIDDING PROCEDURES

2.1 INTERPRETATIONS AND ADDENDA

- A. All requests for interpretation of the Contract Documents shall be made in writing and delivered to the ENGINEER no later than three (3) calendar days prior to opening of Bids. If required, ENGINEER will send written interpretation to all persons receiving a set of Bid Documents in the form of a written Addendum. If a Bidder's request for interpretation is not responded to by ENGINEER, Bidder shall not rely on any interpretation in the request which is contrary to the intent and terms of the Contract Documents.

- B. OWNER will not be responsible for any explanations or interpretations, except those duly issued in the form of written Addenda.
- C. ENGINEER may also issue Addenda to modify the Bidding documents.
- D. Any Addenda so issued during the time of Bidding shall be deemed to be Included in the Bid. All Addenda shall become a part of the Contract Documents.
- E. Except to postpone the Bid opening, no Addenda shall be issued within 72 hours of the Bid opening.
- F. Addenda will be mailed and/or faxed to address or telephone number noted on Plan Holder's List filled out by CONTRACTOR. CONTRACTOR is responsible to provide OWNER with current fax, telephone number, mailing address, and any changes thereto which occur before the Bid is submitted. Failure to receive addenda mailed and/or faxed to the address listed cannot be used as a reason to exclude the addenda from the Bid.

2.2 EQUIPMENT AND MATERIAL OPTIONS PRIOR TO BID OPENING

- A. If a Bidder or supplier wishes to use items of equipment or materials other than those identified in the Contract Documents, said Bidder or supplier shall submit a written request for approval to the ENGINEER at least ten (10) days prior to the date set for opening of Bids.
- B. The procedure for submission of any such product option shall be as set forth in Article 6.4 of the General Conditions. It is the sole responsibility of the Bidder or supplier to submit complete descriptive and technical information so that ENGINEER can make a proper appraisal.
- C. ENGINEER'S failure to act upon such a request within three (3) days after receipt shall be deemed a denial thereof.
Any such approval is at the sole discretion of the ENGINEER and will be in the form of an Addendum issued to all Bidders holding Bid documents indicating that the additional equipment or materials are approved as equal to those specified for the project.

2.3 BID SECURITY

- A. Amount of Bid Security: The total amount of the Bid on which Bid Security is to be based shall be the sum of all items of the Bid constituting the maximum amount of the possible award to the Bidder. The Bond amount must equal at least 5 percent of the total amount of the Bid.
- B. Bid Bond: The Bond shall accompany the Bid and shall be issued by a surety company authorized to do business in the State of Utah. 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. Cashier's Check: If a Cashier's Check is used in lieu of a Bid Bond, the Cashier's Check must be drawn on a bank doing business in the State of Utah and made payable to West Valley City Corporation.

- D. Return of Bid Security: OWNER will return Bid Security to CONTRACTOR within seven (7) days after award of the Construction Contract. Bid Bonds and Cashier's Checks of all Bidders will be held until the Construction Contract is awarded or all Bids have been rejected. The liability of OWNER in regards to the checks shall be limited only to the return of the checks.
- E. Default: In the event of failure or refusal of the Bidder to enter into the Construction Contract and the delivery to the OWNER a Performance Bond, Payment Bond and any other Bonds or documents required by the Contract Documents after Notice of Intent to Award by the OWNER, the Bidder forfeits the sum of the Bid Bond or Cashier's Check as liquidated damages to the OWNER.

2.4 CONTRACT TIME AND PUNCH LIST TIME

- A. Provisions concerning Contract Time and Punch List Time are set forth in the Agreement (Document 00 52 00).

2.5 LIQUIDATED DAMAGES

- A. Provisions concerning liquidated damages are set forth in the Agreement (Document 00 52 00).

2.6 RETAINAGE

- A. Provisions concerning OWNER retaining money are set forth in the Agreement (Document 00 52 00).

2.7 BID FORM

- A. The Bid Form (Document 00 41 00) identifies all forms comprising the Bid Documents.
- B. Bids by corporations must be executed in the corporate name by the president, vice-president or other corporate officer authorized to sign and properly attested to as an official act of the corporation. At the OWNER'S request, authority to sign must be submitted.
- C. Bids by partnerships must be executed in the partnership name and signed by a partner, whose title and official partnership address must be shown.
- D. All names must be typed or printed under or near the signature.
- E. The Bid shall contain an acknowledgment of receipt of all Addenda. The Addenda numbers must be filled in on the Bid Form.
- F. The Bidder's address, telephone number and facsimile number for communications regarding the Bid must be shown on the first page of the Bid Form.
- G. The Bidder shall make no stipulations or alterations on the Bid forms. The Bidder must use only the Bid Form and Bid Schedules bound in the Contract Documents.

2.8 BID SCHEDULE

- A. 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 (Document 00 43 00) shall not be measured or paid for separately. The cost of such work or material shall be considered as included in the Contract Price.
- B. All blanks on the Bid Schedule (Document 00 43 00) must be completed in ink or by typewriter. If applicable, furnish both the unit and the total costs for each item. Numbers shall be stated in figures, and the signature of all persons signing shall be in longhand. The Bidder shall initial any corrections, alterations or erasures made by the Bidder on the Bid Schedule in ink.

2.9 SUBMISSION OF BIDS

- A. The Bid Documents consist of the Bid Form (Document 00 41 00), Bid Schedule (Document 00 43 00), Bid Bond and any supplements or post-bid supplements as found in Modifications or Instructions to Bidders (Document 00 11 16).
- B. Bids shall be submitted at the time and place indicated in the Invitation to Bid (Document 00 11 16) and should be enclosed in an opaque sealed envelope, marked with the project title, the name and address of the Bidder, and the date and the opening time for Bids. If the Bid is sent through the mail or other delivery system, the sealed envelope should be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it. It is the sole responsibility of the Bidder to deliver the Bid before the scheduled time.
- C. Alternate Bids, other than those called for in the Bid Form, will not be considered.
- D. No oral, telegraphic, telephonic, facsimile or modified Bids will be considered.

2.10 MODIFICATION AND WITHDRAWAL OF BIDS

- A. At any time prior to the opening of Bids, Bids may be modified or withdrawn if a written 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 to the reasonable satisfaction of the OWNER. If OWNER agrees, Bidder may withdraw its Bid and the Bid Security will be returned to the Bidder.

2.11 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 (Document 00 11 16) will be returned unopened.

2.12 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 the date.

2.13 NONDISCRIMINATION IN EMPLOYMENT

- A. Work under this Bid will obligate the Bidder and Subcontractors not to discriminate in employment practices.
- B. Bidders must, if requested, submit a compliance report concerning employment practices and policies in order to maintain their eligibility to receive the award of the Construction Contract.
- C. Equal opportunity employment shall be reflected in the racial and sexual composition of the Bidder's work force and the OWNER urges an affirmative action program to overcome under-utilization.
- D. Bidders are advised that the Construction Contract and its performance are subject to the applicable provisions of all Laws and Regulations. Bidder will be obligated upon written request, to give all applicable assurances of compliance in connection therewith.
- E. If federal nondiscrimination requirements are required, the Bidder shall be fully knowledgeable and comply with such requirements. Refer to Community Development Block Grant Supplementary Conditions (Document 00 73 50).

PART 3 AWARD OF CONSTRUCTION CONTRACT

3.1 QUALIFICATIONS OF BIDDERS

- A. Within seven (7) calendar days of ENGINEER'S request, a Bidder, whose Bid is under consideration for award, shall submit to the ENGINEER the following information for the Bidder. ENGINEER may request like information on Bidder's Subcontractors, or Bidder's Suppliers.
 - 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 three (3) years; including project name, address, owner, contact 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, arbitrations, litigations 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 projects similar to the Work in physical size, cost, and commercial nature. If the work experiences of the project manager and superintendent designated to construct this project are different than that of the company, provide resumes of their work history. Include their actual project titles and indicate their actual responsibilities on each given project;
 8. All matters consistent with federal, state and local Laws and Regulations;
 9. Such other data as may be called for in the Modifications to Instructions to Bidders (Document 00 21 14) (if any).
- B. OWNER will hold all requested information confidential to the extent allowed by law, and upon request, return such information to Bidder after acceptance or rejection of Bid.
- C. Untimely response by Bidder will release OWNER of any obligation to further negotiate or consider the Bidder's Bid.

3.2 EVALUATION OF BIDS

- A. OWNER reserves the right: to reject any and all Bids; to waive minor informalities in the Bid Schedule and elsewhere so long as the informalities do not affect the Contract Documents or render the Bid non-compliant with laws and regulations pertaining to bidding requirements; to negotiate and agree to contract terms with the successful Bidder; and to disregard non-conforming, non-responsive, unbalanced or conditional Bids.
- B. OWNER reserves the right to reject any Bid if OWNER believes that it would not be in the best interest of the Project for the OWNER to make an award to that Bidder. Such rejection may be because the Bidder 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 in the Supplementary Instructions to Bidders (Document 00 21 14).
- C. OWNER will consider the qualifications of the Bidder (whether or not the Bid complies with the prescribed requirements) and such alternates, unit prices and other data, as may be requested in the Bid Form (Document 00 41 00), Bid Schedule (Document 00 43 00), or written requests issued prior to OWNER'S Notice of Intent to Award the Construction Contract.
- D. OWNER may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work as provided in the Subcontractors and Supplier Report (Document 00 43 36).
- E. OWNER may consider the operating costs, maintenance requirements, performance data and guarantees of materials and equipment, when such data is required to be submitted prior to the Notice of Intent to Award the Construction Contract.
- F. To establish qualifications of Bidder, OWNER may request such data indicated in Article 3.1 herein above and conduct such investigations, as OWNER deems appropriate.

- G. If the Construction Contract is to be awarded, it will be awarded to the most responsive and lowest, qualified, responsible Bidder as determined by the OWNER. Alternates may be accepted depending upon availability of OWNER funds. Bid alternates will be considered in determining the most responsive, lowest, qualified, and responsible Bidder.
- H. Bid Schedules will be evaluated as follows:
 - 1. On a lump sum basis.
 - 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.

3.3 SUBCONTRACTORS, SUPPLIERS AND OTHERS

- 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.
- B. Conflict of interest pertaining to Subcontractors is described in paragraph 6.5H of the General Conditions.

3.4 CONTRACT SECURITY AND OTHER SUBMITTALS

- A. Performance Bond (Document 00 61 13) and Payment Bond (Document 00 61 14): The OWNER'S requirements as to Performance and Payment Bonds are 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) and the Payment Bond (Document 00 61 14).
 - 1. The Bidder should carefully examine the Bond Forms.
 - 2. When the successful Bidder delivers the executed Construction Contract to OWNER, the required Performance and Payment Bonds must accompany it.
- B. Subcontractor and Supplier Report (Document 00 43 36): This report form is required within 48 hours of ENGINEER'S request. The form shall list the name and address of each Subcontractor who will perform work or labor or render service to the Bidder at the site of the Work, or a Subcontractor who, off the job site, will specially fabricate a portion of the Work or improvements according to detail Drawings. In each instance, the nature and extent of the Work to be sublet in an amount in excess of 2 percent of the Bid sum shall be described. Bidder must have the written consent of OWNER to substitute for any of the Subcontractors or Suppliers designated or to employ any Subcontractor or Supplier that is not listed.
- C. Bidder Status Report (Document 00 43 38): One completed form shall be submitted upon ENGINEER'S request or after Bidder receives Notice of Intent to Award.
- D. 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.

3.5 ADJUSTMENTS TO THE COST OF THE WORK AFTER OPENING OF BIDS AND PRIOR TO AWARD

- A. The Contract Price identified in the Agreement (Document 00 52 00) represents the Cost of the work that is to be paid by the OWNER to the CONTRACTOR. Signing an Agreement Supplement shall effect adjustments to the Contract Price that are agreed to between the OWNER and the successful Bidder.

3.6 SIGNING OF AGREEMENT

- A. Within ten (10) days after OWNER gives Notice of Intent to Award the Construction Contract to the successful Bidder, the Bidder shall pick up, sign and return the required number of copies of the Agreement (Document 00 52 00), Performance Bond (Document 00 61 13), Payment Bond (00 61 14), Certificate of Insurance and documents as specified in the Contract. A minimum of three (3) originals will be signed. One executed original will be returned to the Bidder.
- B. Transfers, delegations or assignments of interests in the Contract Documents are prohibited, unless prior written authorization is received from the OWNER.
- C. At the time of Bidding, and the signing of the Agreement (Document 00 52 00), 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, West Valley City and Salt Lake County.

PART 4 MISCELLANEOUS

4.1 EQUIPMENT AND MATERIAL OPTIONS AFTER BID OPENING

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

END OF DOCUMENT 00 21 13

DOCUMENT 00 2114

MODIFICATIONS TO INSTRUCTIONS TO BIDDERS

This document amends the Instructions to Bidders (Document 00 21 13). Modifications ***have not*** been made on this project.

END OF DOCUMENT 00 21 14

DOCUMENT 00 3132

GEOTECHNICAL DATA

Geotechnical data *has* been obtained and is available for review.

END OF DOCUMENT 00 31 32

DOCUMENT 00 4100

BID FORM

PART 1 GENERAL

1.1 BIDDER

- A. Name: _____
- B. Address: _____
- C. City, State, Zip: _____
- D. Telephone: _____
- E. E-mail: _____
- F. Facsimile: _____
- G. Federal Tax Identification Number: _____
- H. Bidder holds License Number: _____
Issued on _____ 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 _____.

1.2 NOTICE

- A. Pursuant to Section 58-55-6(2)(g). Utah Code Annotated (UCA), it is unlawful to submit a Bid for work for which a license is required under Chapter 55 of Title 58, UCA, by a person or other business entity not licensed or accepted from licensure as a contractor under Chapter 55 of Title 58, UCA. Pursuant to Section 58-556(3), UCA, contracts for the work may not be awarded to any person or other business entity that violates Section 58-556(2)(g), UCA, in submitting its bid.

1.3 CONSTRUCTION PROJECT

- A. Project Name: **Sunset Hills Park - Site Improvements Project**
- B. Project No: **WVC-PR-P006**
- C. OWNER: West Valley City, a municipal corporation of the State of Utah, 3600 South Constitution Blvd, West Valley City, Utah 84119.

1.4 ADDENDA

- A. Bidder hereby acknowledges receipt of the following Addenda.

(list Addenda numbers here)

1.5 SUBMITTALS

- A. To Bid for the Work, Bidder is required to submit the Bid Documents consisting of the Bid Form (Document 00 41 00), Bid Schedule (Document 00 43 00), Bid Bond and any supplements or post-bid supplements as found in Modifications or Instructions to Bidders (Document 00 21 14).
- B. If Bidder receives notice after Bid Opening that OWNER is considering awarding the contract to the bidder, the Bidder is to submit the following documents:
1. ☐ Document 00 43 44 - Waiver of Interest Affidavit (CDBG)
 2. ☒ Document 00 43 38 - Bidder Status Report
 3. ☒ Document 00 43 36 - Subcontractor and Supplier Report
 4. ☒ Document 00 52 00 - Agreement
 5. ☒ Document 00 61 13 - Performance Bond
 6. ☒ Document 00 61 14 - Payment Bond
 7. ☒ Document 00 62 16 - Certificate of Insurance
 8. ☐ Document 00 21 15 - Community Development Block Grant (CDBG)
 9. ☐ Document 00 43 40 – Minority and Women Business Enterprises Reg. (CDBG)
 10. ☐ Document 00 43 43 - Wage Determination Schedule (CDBG)

1.6 DEFINITIONS

- A. Bid Documents: The Bid Documents consist of the Bid Form (Document 00 41 00), Bid Schedule (Document 00 43 00), bid Bond and any supplements or post-bid supplements as found in Modifications or Instructions to Bidders (Document 00 21 14).
- B. Bid Bond: AIA Document A310 as published by the American Institute of Architects, 1736 N.Y. Ave. N.W. Washington, D.C. 20006 or one substantially the same and acceptable to the OWNER.

PART 2 COVENANTS

2.1 BIDDER TO ENTER INTO AN AGREEMENT

- A. In General: Bidder agrees, if this Bid is accepted, to enter into a Construction Contract with the OWNER to perform and furnish all work specified or indicated in the Contract

Documents at the Contract Time and Contract Price identified in the Agreement (Document 00 52 00).

- B. Agreement Supplement: If it becomes necessary to further define the Work, contract Price, Contract Time or some other portion of the Construction Contract prior to signing the Agreement (Document 00 52 00), ENGINEER shall prepare an Agreement Supplement (Document 00 54 00) describing, such change. The necessity for preparing such a contract modification is the OWNER'S sole option. If the Agreement Supplement is acceptable to the Bidder, the Bidder agrees to execute Agreement Supplement prior to or concurrent with the execution of the Agreement (Document 00 52 00).

2.2 BIDDER ACCEPTS TERMS AND CONDITIONS

- A. Bidder accepts all of the terms and conditions of the Bid Documents, including without limitation those dealing with the disposition of Bid Security.
- B. Bidder will pick up, sign and submit the Agreement (Document 00 52 00) with the Bonds and other documents required in the Contract within ten (10) days after the date of OWNER'S Notice of Intent to Award the Construction Contract.

2.3 REPRESENTATION OF BIDDER

- A. In submitting the Bid, Bidder represents, as more fully set forth in the Instructions to Bidders (Document 00 21 13), that:
 - 1. Nature of the Work: Bidder has become familiar with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and laws and regulations that in any manner may affect cost, progress, performance or furnishing of the Work.
 - 2. Surface and Subsurface Conditions: Bidder has studied carefully all reports and drawings of subsurface conditions and drawings of physical conditions that are identified in the Geotechnical Data (Document 00 31 32), (if any).
 - 3. Underground Utilities: Bidder has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing underground facilities at or contiguous to the site.
 - 4. Bidder Investigation: Bidder has correlated the result of all observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
 - 5. Discrepancy Resolutions: Bidder has given ENGINEER written notice of all conflicts, errors or discrepancies that Bidder has discovered in the Contract Documents and acknowledges that all written resolutions thereof, issued by ENGINEER prior to Bid Opening are acceptable to Bidder.

2.4 OWNER'S RIGHTS AT BID AWARD

- A. Bidder agrees OWNER has the right to reject this Bid, or to award the Work or any part thereof to the undersigned at the prices stipulated. Bidder agrees to make no claim for damages for such rejection or award.
- B. If the Bid is rejected, then the Bid Security shall be returned to the Bidder.
- C. If the Bid is accepted, the OWNER will notify Bidder of OWNER'S intent to award the Construction contract to the Bidder. The Bidder shall have ten (10) days to sign and return the Agreement (Document 00 52 00). Performance Bond (Document 00 61 13), Payment Bond (Document 00 61 14) and Certificate of Insurance to the ENGINEER. If Bidder fails to sign the Agreement, the Bid Security, at OWNER'S option, shall be claimed and cashed and the amount thereof, paid to OWNER as liquidated damages for failure of the Bidder to comply with the terms of the Bid.
- D. Bidder agrees the Bid may be rejected if the submittals listed in this Document or the Notice of Intent to Award is not submitted within the time listed in the Notice of Intent to Award.

2.5 NON-COLLUSION

- A. Bidder agrees the Bid is genuine. The Bid is not made in the interest of or on behalf of any undisclosed person, firm or corporation.
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
- C. Bidder has not solicited or induced any person, firm or corporation to refrain from bidding.
- D. Bidder has not sought by collusion to obtain for itself any other advantage over any separate Bidder or over OWNER.

2.6 BID PRICING

- A. Bidder will complete the Work for the prices listed in the Bid Schedule (Document 00 43 00).

2.7 SUBSTANTIAL COMPLETION, PROJECT COMPLETION AND LIQUIDATED DAMAGES

- A. Bidder agrees that the Work will be substantially complete and ready for final inspection on or before the expiration of the Contract Time indicated in the Agreement (Document 00 52 00).

- B. Bidder agrees the Work will be complete and ready for final payment in accordance with Article 14.9 of the General Conditions (Document 00 72 00) on or before the expiration of the punch list time indicated in the Agreement (Document 00 52 00).
- C. Bidder accepts the provisions of the Agreement (Document 00 52 00) as to liquidated damages in the event of failure to complete the Work on time and in accordance with the Contract Documents.

PART 3 EXECUTION

3.1 EFFECTIVE DATE

- A. Bidder executes this Bid and declares it to be in effect as of _____ day of _____, 20_____.

3.2 BIDDER'S SUBSCRIPTION

- A. Bidder's Signature: _____
- B. Please print Bidder's name here: _____
- C. Title: _____

END OF DOCUMENT 00 41 00

DOCUMENT 00 43 00

BID SCHEDULE

PART 1 GENERAL

1.1 DOCUMENT INCLUDES

- A. Schedules of prices
- B. Construction Drawings, Plans and Specifications as Attachment
- C. Measurement and Payment provisions

1.2 CONSTRUCTION PROJECT

- A. Project Name: **Sunset Hills Park**
- B. Project No: **WVC-PR-P006**
- C. OWNER: West Valley City Corporation, a municipal corporation of the State of Utah, 3600 South Constitution Blvd, West Valley City, Utah 84119.

1.3 SCHEDULE TO BE ADDED TO THE AGREEMENT

- A. This Bid Schedule will be incorporated into the Agreement (Document 00 52 00) by reference.
- B. Apparent low Bid will be the lowest Total Bid (total of schedule 1 and accepted bid alternate Schedules). Contract award will be based upon the lowest Total Bid.
- C. Bidder further proposes to accept as full payment for the Work proposed herein in the amounts computed under the provisions of the Contract Documents and based on the unit prices provided in the Bid Proposal, it being expressly understood that the lump sum prices are independent of the exact quantities involved. Bidder agrees that the lump sum prices represent the true measure of the labor, materials and services required to furnish and install the item, including all allowances for overhead and profit for each type of work called for in these Contract Documents.
- D. Refer to plans and specifications for detailed descriptions of work to be included in each bid item.

1.4 SCHEDULE OF PRICES

A. Base Bid Schedule is composed of:

1. Schedule No. 1

B. The Schedules are provided on the pages following this paragraph.

C. Cost of the Work is as follows:

1. Base Bid – Schedule No. 1 \$ _____

2. Alternate Schedules – No. 1 \$ _____

D. Payment Procedures: As per APWA Section 01 29 00.

BID SCHEDULE

Base Bid – Schedule No. 1

Sunset Hills Park

UNIT PRICE BREAKDOWN

Owner requires Contractor to submit a lump-sum base bid listed above as well as submitting the following installed unit costs, including Contractor overhead and profit. **The items listed below will only to be used should the need arise to add or delete items during construction and are not intended to be an itemized list comprising of the contractors lump-sum bid.** Unit costs listed below must be valid for either adding or deleting and must be submitted with the Contractor's bid. Contractors failing to do so may be disqualified. Owner reserves the right to reject or modify any and/or all bids, and/or individual bid items, and/or quantities.

Item No.	Unit	Description of Bid Unit Items (includes all parts, labor and materials)	Unit Bid Price (\$0.00)	
1	SF	Clearing and Grubbing		
2	SF	Rough Grading		
3	CY	Cut Material		
4	CY	Fill Material		
5	CY	Top Soil		
6	SF	Finish Grading		
7	Each	Infiltration Well		
8	SF	Concrete Paving – standard (4" over 4")		
9	SF	Bark Mulch – 3" depth		
10	SF	Rock Mulch – 4" depth		
11	Each	Landscape Boulder – 3-4ft. dia.		
12	LF	Concrete Mow Curb-6"		
13	Each	Infiltration Well		
14	LF	Concrete Playground Edging		
15	LF	Concrete Playground Curb Wall		
16	LF	Landscape Boulder Retaining Wall (3ft-high)		
17	LF	3/4" HPDE DR-11 Pipe and Fittings		

18	LF	Drinking Fountain Drain Line – 2” PVC		
19	Each	Rainbird PCT Drip Bubbler		
20	Each	Rainbird X CZ-100-PRB-LC 1” valve assembly		
21	Each	Rainbird X CZ-150-PRB-COM 1.5” valve assembly		
22	Each	Rainbird 5006-PL-PC, FC-MPR-SAM-R-SS rotor		
23	Each	Rainbird PEB-PRS-D 2” valve assembly		
24	Each	Rainbird PEB-PRS-D 1.5” valve assembly		
25	Each	Rainbird PEB-PRS-D 1” valve assembly		
26	Each	Rainbird 44-NP 1” Quick Coupler Valve		
27	Each	Gate Valve – 2” (per plans)		
28	Each	Isolation Valve – 2” (per plans)		
29	Each	Isolation Valve – 1.5” (per plans)		
30	Each	Isolation Valve – 1” (per plans)		
31	LF	2” Sched. 80 PVC Pipe and Fittings		
32	LF	1.5” Sched. 80 PVC Pipe and Fittings		
33	LF	1” Sched. 80 PVC Pipe and Fittings		
34	LF	2” Sched. 40 PVC Pipe and Fittings		
35	LF	1.5” Sched. 40 PVC Pipe and Fittings		
36	LF	1” Sched. 40 PVC Pipe and Fittings		
37	LF	3/4” Sched. 40 PVC Pipe and Fittings		
38	Each	Deciduous Tree – 3” cal.		
39	Each	Deciduous Tree – 2” cal.		
40	Each	Evergreen Tree – 10-12’ high		
41	Each	Shrub – 5 gal.		
42	Each	Ornamental Grass – 5 gal.		
43	Each	Perennial – 1 gal.		
44	SF	Turf-Grass Sod		

Note: All items of work shown on the plans and specifications must be included in the base bid. Contractor is responsible for the completeness of his base bid. Changes in planned quantities will be changed according to the above listed Unit Prices.

Alternate Schedules:

- #1 Post-Tensioned Concrete Paving at Basketball Court
 - A. 1. Base Bid: standard concrete paving
 - B. 2. Additive Alternate: post-tensioned concrete paving per detail and specifications

1.5 UNIT PRICE – MEASUREMENT AND PAYMENT

- A. Base Bid Items: Schedule No. 1.
- B. Additional Bid Item – Alternate Schedule 1
- C. As per APWA Section 1 29 00
 - a. Measured on a percent complete basis

END OF DOCUMENT 00 43 00

DOCUMENT 00 4301

BIDDER PREFERENCE FORM

1.1 PREFERENCES

- A. The City grants preferences to certain types of bidders. After reviewing the requirements below, please indicate which preferences apply to this bid.
- B. City Provider Preference – the City provides a 1% preference to any bidder who is physically located within City limits.
1. ☐ Yes ☐ No - **City Provider preference**
- C. Other Preferences – the City provides a 1% preference to any bidder who can meet ALL of the following criteria:
1. **Program for veteran hiring and recruitment** - To meet this criterion, the bidder must maintain an active program to recruit and employ veterans
☐ Yes ☐ No
2. **Safety** – To meet this criterion, the bidder must maintain an active safety training program
☐ Yes ☐ No
3. **Drug testing** – To meet this criterion, the bidder must maintain a drug testing protocol in accordance with applicable law
☐ Yes ☐ No
4. **Job training** – To meet this criterion, the bidder must maintain an active job training program for employees
☐ Yes ☐ No
5. **Health insurance** – To meet this criterion, the bidder must offer health insurance to all full time employees
☐ Yes ☐ No
6. **Nondiscrimination** – To meet this criterion, the bidder must have and enforce a policy prohibiting discrimination in accordance with Title 26 of the West Valley City Municipal Code
☐ Yes ☐ No

1.2 OTHER PROVISIONS

- A. City reserves the right, in its sole discretion, to verify that a bidder qualifies for any preferences which may be claimed above. If a bid claims a preference but does not qualify for that preference, the City reserves the right to refuse to consider that bid.

END OF DOCUMENT 00 43 01

SUBCONTRACTOR AND SUPPLIER REPORT

PART 1 GENERAL

1.1 BIDDER

- A. Name: _____
- B. Address: _____
- C. City, State, Zip: _____
- D. Telephone: _____
- E. Facsimile: _____

1.2 CONSTRUCTION PROJECT

- A. Project Name: **Sunset Hills Park**
- B. Project No: **WVC-PR-P006**
- C. OWNER: West Valley City Corporation, a municipal corporation of the State of Utah, 3600 South Constitution Blvd, West Valley City, Utah 84119.

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. Bidder must have the written consent of OWNER to substitute for any of the Subcontractors or Suppliers designated below or to employ any Subcontractor or Supplier that is not listed below.
- 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 5 percent of the Bid sum) are set forth as follows.

Table 1

SUBCONTRACTORS		
Name	Nature and Extent of Work to be Sublet	Dollar Amount
1.		
2.		
3.		
4.		
5.		
SUPPLIERS		
Name	Nature and Extent of Work to be Sublet	Dollar Amount
1.		
2.		
3.		
4.		
5.		

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 (Document 00 41 00) and in effect as of _____ day of _____, 20____.

3.2 BIDDER'S SUBSCRIPTION

- A. Bidder's Signature: _____
- B. Please print Bidder's name here: _____
- C. Title: _____

END OF DOCUMENT 00 43 36

BIDDER STATUS REPORT

PART 1 GENERAL

1.1 BIDDER

- A. Name: _____
- B. Address: _____
- C. City, State, Zip: _____
- D. Telephone: _____
- E. Facsimile: _____

1.2 CONSTRUCTION PROJECT

- A. Project Name: ***Sunset Hills Park.***
- B. Project No: ***WVC-PR-P006***
- C. OWNER: West Valley City Corporation, a municipal corporation of the State of Utah,
3600 South Constitution Blvd, West Valley City, Utah 84119.

PART 2 REPORT

2.1 BIDDER STATUS REPORT

- A. Bidder affirms the following information is true and correct.
1. Number of Employees:
 2. Bidder's firm is: (check the following as applicable)
 - ☐ Independently owned and operated
 - ☐ An affiliate of
 - ☐ A subsidiary of
 - ☐ A division of
 - ☐ A business with gross revenue in excess of \$ _____
 - ☐ A business with gross revenue below \$ _____

*PARENT COMPANY:

Name: _____

Address: _____

Telephone: _____

Facsimile: _____

PART 3 EXECUTION

3.1 EFFECTIVE DATE

- A. Bidder executes this status report and declares it to be a supplement to the Bid Form (Document 00 41 00) and in effect as of the ____ day of _____, 20 ____.

3.2 BIDDER'S SUBSCRIPTION

- A. Bidder's Signature: _____
- B. Please print Bidder's name here: _____
- C. Title: _____

END OF DOCUMENT 00 43 38

CONTRACT FORMS

DOCUMENT 00 5200

AGREEMENT

PART 1 GENERAL

1.1 CONTRACTOR

- A. Name: _____
- B. Address: _____
- C. City, State, Zip: _____
- D. Telephone: _____
- E. Facsimile: _____

1.2 OWNER

- A. OWNER: West Valley City Corporation, a municipal corporation of the State of Utah, 3600 South Constitution Blvd, West Valley City, Utah 84119.

1.3 CONSTRUCTION PROJECT

- A. Project Name: **Sunset Hills Park**
- B. Project No: **WVC-PR-P006**

1.4 ENGINEER

- A. **Jason Erikson**, 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 CONTRACT DOCUMENTS

- A. The Bid Documents, Agreement, Agreement Supplement, General Conditions, Supplementary Conditions, Specifications, Standard Specifications, Drawings, Standard Plans together with all Modifications issued pursuant to Article 3.3 of Section 00 72 00 of the Manual of Standard Specifications, 2017 Edition.

PART 2 TIME AND MONEY CONSIDERATIONS

2.1 CONTRACT PRICE

- A. The Contract Price includes the cost of the Work specified in the Contract Documents, plus the cost of all bonds, insurance, permits, fees and all charges, expenses or assessments of whatever kind or character.
- B. The Schedules of Prices awarded from the Bid Schedule (Document 00 43 00) are as follows:
 - 1. Base Bid - Schedule No. 1
 - 2. Approved Alternate Schedules
- C. An Agreement Supplement (Document 00 54 00) **is not** attached to this Agreement.
- D. Based upon the above awarded schedules and the Agreement Supplement (if any), the Contract Price awarded is: _____ dollars and _____ cents (\$ _____).

2.2 CONTRACT TIME

- A. Contract Time shall be:
 - 1. The work shall be Substantially Complete within **one hundred (100) calendar days** of Notice to Proceed. Final completion shall be achieved within **fifteen (15)** calendar days of Notice of Substantial Completion.
 - 2. Any time specified in work sequences in the Summary of Work (Document 01 11 00) shall be part of the Contract Time.

2.3 PUNCH LIST TIME.

- A. The Work will be complete and ready for final payment within **fifteen (15)** 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. Late Completion: Time is the essence of the Contract Documents. CONTRACTOR agrees that OWNER will suffer damage or final loss if the Work is not completed on time or within any time extensions allowed in accordance with Part 12 of the General Conditions (Document 00 72 00). 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 final 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: **\$200.00** for each day or part thereof that expires after the Contract Time until the Work is accepted as Substantially Complete as provided in Article 14.5 of the General Conditions (Document 00 72 00).
 2. Late Punch List Time Completion: **Fifty Percent (50%)** of the amount specified for Late Contract Time Completion for each day or part thereof if the Work remains incomplete after the Punch List Time. The Punch List shall be considered delivered on the date it is transmitted by facsimile, hand delivery or received by the CONTRACTOR by certified mail.
- B. Work Sequence Completion: Time is the essence of sequenced work. If a work sequence is specified, then for each day or part thereof that exceeds the specified time and until ENGINEER determines such work sequence is Substantially Complete, the CONTRACTOR agrees to pay the following sums to the OWNER as liquidated damages and not as a penalty.
1. **N/A**
- C. Survey Monuments: No land survey monument shall be disturbed or removed until ENGINEER has been properly notified and the ENGINEER'S surveyor has referenced the survey monument for resetting. The parties agree that upon such an unauthorized disturbance, it is difficult to determine the damages from such a disturbance. The parties also agree that CONTRACTOR will pay as liquidated damages the sum of one thousand dollars (\$1,000.00) to cover such damage and expense.
- D. 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 damages stipulated above shall not be deemed to be a limitation upon OWNER'S right to recover the full amount of such damages. Because of the difficulty in determining the OWNER'S damages resulting from an unapproved interruption, the parties agree payment of the following liquidated damages to OWNER on a per day basis does not relieve CONTRACTOR from any liability for such a utility interruption to third parties.
1. **N/A**
- In the event that any third party successfully makes a claim against OWNER for such interruption, CONTRACTOR shall be responsible for payment of claims.

- E. Deduct Damages from Moneys Owed CONTRACTOR: OWNER shall be entitled to deduct and retain liquidated damages out of any money that may be due or become due the CONTRACTOR. The extent that the liquidated damages exceed any amounts that would otherwise be due the CONTRACTOR, the CONTRACTOR shall be liable for such amounts and shall return such excess to the OWNER.

2.5 RETAINAGE

- A. Retainage is OWNER'S Option: OWNER may, in its sole discretion, retain five percent (5%) of the value of all Work done and materials or equipment supplied as part security for the fulfillment of the Construction Contract by the CONTRACTOR. If, in ENGINEER'S opinion, the Work is proceeding in accordance with CONTRACTOR'S approved progress schedule, and all progress schedule submittals are current and up to date, and all required payrolls, shop drawings, and miscellaneous submittals are current and up to date, the OWNER may choose not to withhold retainage.
1. Amount to be Retained: If at any time after 50% of the Work has been completed, and \$50,000 or more has been retained, OWNER may make any of the remaining progress payments in full, if, in the OWNER'S sole discretion, the Work is progressing satisfactorily. OWNER may pay monthly to the CONTRACTOR while carrying on the Work, the balance not retained as aforesaid, after deducting there from all previous payments and all sums to be kept or retained under the provisions of the Construction Contract. No such estimate of payment shall be required to be made when, in judgement of the ENGINEER, the Work is not proceeding in accordance with the Contract Documents or when in ENGINEER'S judgement the total value of the Work done since the last estimate amounts to less than three hundred dollars (\$300.00). No such estimate or payment shall be construed to be an acceptance of any defective or improper Work or materials.
 2. Reducing the Retainage: As the Work nears completion and solely at the ENGINEER'S discretion, the OWNER may reduce the retainage to an amount more in line with the Work actually remaining.
 3. Retainage Held Until Final Payment: The OWNER reserves the right to retain all amounts previously withheld or due the CONTRACTOR, including liquidated damages, until all Punch List items are complete. However, at ENGINEER'S sole option, ENGINEER may authorize the release of up to all retained amounts except any liquidated damages and double ENGINEER'S best estimate of the CONTRACTOR'S cost to complete all remaining Punch List items.
- B. Interest: Except when CONTRACTOR is required to submit a Waiver of Interest Affidavit (Document 00 43 44), and except for money retained for items not provided or installed in accordance with the Contract Documents, any money retained by the OWNER will be placed in an interest bearing account held by the OWNER as of the date such money would have otherwise been payable. The interest accrued thereon will be due and payable to the CONTRACTOR within 30 days after the retained monies are paid.

2.6 PAYMENT PROCEDURES

- A. Progress Payments: CONTRACTOR shall submit Applications for Payment in accordance with Part 14 of the General Conditions (Document 00 72 00). Payment shall not become due or payable for any contract item not provided or installed by CONTRACTOR.
1. Withholding Payment: OWNER reserves the right to withhold payment from CONTRACTOR for non-compliance with any provision of the Contract Documents.
 2. Price Adjustments: OWNER will consider making partial payment to the CONTRACTOR for certain non-conforming work in advance of any negotiated settlement reached between the CONTRACTOR and the OWNER, provided the CONTRACTOR requests in writing that this be done. CONTRACTOR agrees that any such payments made by the OWNER are “payments in advance” and that any money that becomes due when the final settlement is negotiated will not constitute payments “withheld” or “retained” under State Law.
- B. Final Payment: After completion of all Work and Punch List items, OWNER, shall pay the Contract Price due after deducting there from all previous payments, unit price quantity adjustments, penalties, liquidated damages, and other amounts to be retained. All prior progress payments shall be subject to correction in the final payment. The final payment shall not be due and payable until the expiration of 30 days from approval of the request for final payment of CONTRACTOR by the OWNER’S finance department.
1. Submittal: Final payment shall not be made until the CONTRACTOR has delivered and ENGINEER has accepted all submittals specified in Article 14.8 of the General Conditions (Document 00 72 00).
 2. OWNER Released From Claims: The payment and acceptance of the final Contract Price due and the adjustment and payment for any Work done in accordance with any alterations of the same, shall release the OWNER from any and all claims of CONTRACTOR on account of Work performed under the Contract Documents or any modification thereof, except for those claims specifically agreed to as reserved and unresolved by the OWNER.

2.7 EXTRA WORK

- A. No money will be paid to the CONTRACTOR for any additions, deletions or revisions in the Work as stipulated in Article 10.1 of the General Conditions (Document 00 72 00), unless a Contract Modification for such has been made in writing and executed by the OWNER and CONTRACTOR.

PART 3 COVENANTS

3.1 ASSIGNMENT NOT BINDING WITHOUT WRITTEN CONSENT

- A. OWNER and CONTRACTOR agree no assignment of any right or interest in the Contract Documents will be made without the written consent of the OWNER and the CONTRACTOR. No assignment will release or discharge the OWNER or the CONTRACTOR from any duty or responsibility under the Contract Documents unless specifically stated to the contrary in any written consent to an assignment.
- B. CONTRACTOR shall make no assignment of money that is due without the OWNER'S written consent (except to the extent that the effect of this restriction may be limited by Law or Regulation).

3.2 BINDING TERMS

- A. OWNER and CONTRACTOR each binds itself, its partners, successors, assign and legal representatives to the other party hereto, its partners, successors, assign and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.

3.3 INDEMNIFICATION

- A. Provisions concerning indemnification are set forth in Article 6.17 of the General Conditions (Document 00 72 00).

3.4 DISPUTE RESOLUTION

- A. In General:
 - 1. Unless a decision shall be held by an appropriate court of law to have been procured by fraud or to be arbitrary and capricious or so grossly erroneous as necessarily to imply bad faith, any factual decision made under this Article shall be final and binding in any suit or action arising under this Construction Contract, including any actions by CONTRACTOR or others against OWNER or any of OWNER'S agents, consultants, or employees.
 - 2. Compliance with provisions of this Article, shall be a condition precedent prior to any legal action by the CONTRACTOR or any of CONTRACTOR'S Subcontractors and Suppliers against OWNER or any of OWNER'S agents, consultants, or employees.
 - 3. The provisions of this Article shall not preclude or limit judicial review of issues of law.
 - 4. Ambiguities in or between Contract Documents shall be construed in favor of the OWNER.

- B. Disputes Not Related to the Guarantee of the Work: Any dispute arising under the Construction Contract concerning a question of fact, not related to the guarantee of the Work (Article 13.1 of the General Conditions (Document 00 72 00)), which is not disposed of by contract modification shall be decided pursuant to the following procedure:
1. Any decision by ENGINEER interpreting the requirements of the Contract Documents may be appealed in writing to the ENGINEER. The ENGINEER'S decision shall be reduced to writing and a copy shall be mailed or otherwise furnished to the CONTRACTOR. The decision of ENGINEER shall be final and conclusive unless, within 30 days from the date of receipt of such copy, the CONTRACTOR mails or otherwise furnishes to ENGINEER a written appeal to the City Engineer.
 2. Within 15 days from the receipt of any such appeal, the City Engineer shall issue a decision in writing and mail or otherwise furnish a copy thereof to the CONTRACTOR. The decision of the City Engineer shall be final and conclusive unless, within 15 days from the date of receipt of such decision, the CONTRACTOR mails or otherwise furnishes to the City Engineer a written appeal to the Standing Appeals and Dispute Committee.
 3. The Standing Appeals and dispute Committee shall consist of the City Attorney, Public Works Director and City Manager, or their designees.
 4. The City Engineer issuing the decision appealed from shall present the department's case prior to deliberations of the Committee, otherwise the City Engineer shall be disqualified and excluded from the Committee's decision process.
 5. The decision of said Committee shall be rendered in writing within 15 days from receipt of the appeal and mailed or otherwise delivered to the CONTRACTOR.
 6. The decision of said Committee shall be the final binding interpretation of the facts that are the subject of the appeal.
- C. Disputes Related to the Guarantee: Except as otherwise provided by contract modification, any dispute concerning a question of fact involving or arising out of the guarantee required by the Contract Documents (Article 13.1 of the General Conditions (Document 00 72 00)), which is not disposed of by contract modification shall be decided pursuant to the provisions of Paragraph 3.4B above, except that the initial factual decision shall be issued in writing by the ENGINEER, together with the City Engineer. Any appeal there from shall be made within 15 days directly to the Standing Appeals and Dispute Committee where such disputes shall be governed by Paragraphs 3.4B.3 to 3.4B.6 above.
- D. Work During Appeal: Notwithstanding the pendency of any protest or appeal provided above, CONTRACTOR shall, if so ordered by ENGINEER, proceed with the Work under the Contract Documents according to ENGINEER'S direction and according to the decision on any appeal. The existence of a claim or protest shall not excuse CONTRACTOR from the requirements of the Contract Documents, including, but not limited to, the Contract Time.
- E. Appeals of Termination or Suspension: Any decision of OWNER to terminate or suspend the Work shall not be subject to the provisions of this Article.

3.5 ATTORNEYS FEES

- A. In the event there is a failure to perform under this Agreement and it becomes reasonably necessary for any party to employ the services of an attorney in connection therewith (whether such attorney be in house or outside counsel), either with or without litigation, on appeal or otherwise, the losing party to the controversy shall pay to the successful party reasonable attorneys fees incurred by such party, and, in addition, such costs and expenses as are incurred in enforcing this Agreement.

3.6 CHOICE OF LAW

- A. This Agreement shall be interpreted pursuant to, and the terms thereof governed by, the laws of the State of Utah. This Agreement shall be further governed by CITY ordinances in effect at the time of the execution of this Agreement. However, the parties expressly acknowledge that any subdivision or other development regulations enacted after the execution of this Agreement, which are reasonably necessary to protect the health, safety, and welfare of the citizens of CITY, shall also apply to the subdivision or development that is the subject of this Agreement.

3.7 SEVERABILITY

- A. If a court of competent jurisdiction declares any portion of this Agreement invalid, the remaining portions shall not be affected thereby, but shall remain in full force and effect.

3.8 INTEGRATION

- A. This Agreement, including all Contract Documents as defined herein, embodies the entire understanding of the parties, and there are no further or other agreements or understandings, written or oral, in effect between the parties relating to the subject matter herein.

3.9 EMPLOYMENT STATUS VERIFICATION

- A. Contractor warrants that it is in and shall remain in compliance during the term of this Agreement with the Status Verification System requirements of Utah Code Annotated Section 63G-11-103.

PART 4 EXECUTION

4.1 EFFECTIVE DATE

- A. OWNER and CONTRACTOR executed this Agreement and declared it in effect as of the _____ day of _____, 20____.

4.2 CONTRACTOR'S SUBSCRIPTION AND ACKNOWLEDGEMENT

- A. Type of organization: _____
(corporation, partnership, individual, etc.)
- B. If CONTRACTOR is a corporation, attach a corporate resolution evidencing CONTRACTOR'S authority to sign.
- C. CONTRACTOR'S Utah license number: _____
- D. CONTRACTOR'S signature: _____
- E. Please print name here: _____
- F. Title: _____
- G. Corporate Acknowledgement:
In the County of _____, State of _____, on the _____ of _____, 20_____ personally appeared before me _____ (name of person), whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who affirmed that he/she is the _____ (title) of _____ (name of corporation), a corporation, and that said document was signed by him/her in behalf of said corporation by authority of its bylaws or of a Resolution of its Board of Directors, and he/she acknowledged to me that said corporation executed the same.
- _____
Notary Public
- H. Agent for Service of Process:
1. Agent's signature: _____
2. Agent's title: _____
- I. Corporate Authority: At the request of the OWNER, evidence satisfactory to the OWNER shall be submitted which shows the person executing this Agreement has the required authority to execute this Agreement.

4.3 OWNER'S SUBSCRIPTION AND ATTESTATION

- A. Approval as to form: _____
(OWNER'S attorney)
- B. Approval as to budget: _____
(OWNER'S Parks and Recreation Director)
- C. OWNER'S signature: _____
- D. Name and Title: _____
- E. Attest: _____
(signature of City Recorder or City Recorder designee)

END OF DOCUMENT 00 52 00

DOCUMENT 00 6113

PERFORMANCE BOND

PART 1 GENERAL

1.1 BOND

- A. Number: _____
- B. Amount: _____
- dollars and _____ cents (\$ _____)

1.2 SURETY

- A. Name: _____
- B. Address: _____
- C. City, State, Zip: _____
- D. Telephone: _____
- E. Facsimile: _____

1.3 CONTRACTOR

- A. Name: _____
- B. Address: _____
- C. City, State, Zip: _____
- D. Telephone: _____
- E. Facsimile: _____

1.4 OWNER

- A. OWNER: West Valley City Corporation, a municipal corporation of the State of Utah,
3600 South Constitution Blvd, West Valley City, Utah 84119.

1.5 CONSTRUCTION PROJECT

- A. Project Name: **Sunset Hills Park**
- B. Project No: **WVC-PR-P006**

1.6 DEFINED TERMS

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

PART 2 COVENANTS

2.1 SURETY'S AND CONTRACTOR'S RELATIONSHIP

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

2.2 NOTICE

- A. Notice to the Surety, the OWNER or the CONTRACTOR shall be sent by certified mail, facsimile, or hand delivered to the address shown on this bond agreement.
- B. Notices sent as required by paragraph 2.2A shall be effective on the date on which such notice was sent.
- C. Notice may be sent by facsimile. Facsimile notice shall be effective on the date of transmission provided that a confirmation establishing the successful transmission of the notice is sent by first-class mail, postage prepaid, along with a copy of the notice transmitted, not later than twenty-four (24) hours after the facsimile notice is transmitted.
- D. If any notice requires a period of less than seven (7) days for response, the notice shall be sent by facsimile.
- E. If the time for response to any notice expires on a Saturday, Sunday or a legal holiday in the State of Utah, the time shall be extended to the next working day.

2.3 PROCEDURE TO INVOKE SURETY'S OBLIGATION

- A. If the CONTRACTOR fails to perform or to comply with the terms of the Construction Contract, and such failure to perform or to comply has not been waived by the 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 ten (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.
- C. Surety to Pay OWNER: Surety may determine the amount not to exceed the amount of this bond specified in paragraph 1.1, 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 that are or may become due for any reason.
- C. Should there be a default of the SURETY under the terms of this Bond or should the SURETY in any way fail to act as required under the terms of this Bond and the Agreement as determined by a court of competent jurisdiction, the SURETY shall be directly obligated to pay any and all costs, expenses and any other damages flowing to the CITY, including, but not limited to, court costs and attorneys fees (whether such fees be the result of in-house or outside counsel), plus interest thereon, irrespective of whether such costs, expenses, damages, and interests exceed the limit of the amount of this Bond.

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 West Valley City, State of Utah.

2.10 ATTORNEY'S FEES

- A. In the event there is a failure to perform under this Agreement and it becomes reasonably necessary for any party to employ the services of an attorney in connection therewith (whether such attorney be in house or outside counsel), either with or without litigation, on appeal or otherwise the losing party to the controversy shall pay to the successful party reasonable attorneys fees incurred by such party, and, in addition, such costs and expenses as are incurred in enforcing this Agreement.

PART 3 EXECUTION

3.1 EFFECTIVE DATE

- A. Surety and CONTRACTOR executed this Bond Agreement and declared it to be in effect as of _____ day of _____, 20_____.

3.2 CONTRACTOR'S SUBSCRIPTION AND ACKNOWLEDGEMENT

- A. Type of organization: _____
(corporation, partnership, individual, etc.)
- B. If CONTRACTOR is a corporation, attach a corporate resolution evidencing CONTRACTOR'S authority to sign.
- C. CONTRACTOR'S signature: _____
- D. Please print name here: _____
- E. Title: _____
- F. Corporate Acknowledgement:

In the County of _____, State of _____, on
the _____ day of _____, 20 _____, personally appeared
before me _____ (name of person),
whose identity is personally known to me or proved to me on the basis of satisfactory
evidence, and who affirmed that he/she is the _____ (title)
of _____ (name of corporation), a
corporation, and that said document was signed by him/her in behalf of said corporation
by authority of its bylaws or of a Resolution of its Board of Directors, and he/she
acknowledged to me that said corporation executed the same.

Notary Public

3.3 SURETY'S SUBSCRIPTION AND ACKNOWLEDGEMENT

- A. Attach evidence of Surety's corporate authority to sign.
- B. Surety's signature: _____
- C. Please print name here: _____
- D. Title: _____
- E. Acknowledgement:

In the County of _____, State of _____, on
the _____ day of _____, 20 _____, personally appeared
before me _____ (name of person),
whose identity is personally known to me or proved to me on the basis of satisfactory
evidence, and who affirmed that he/she is the _____ (title)
of _____ (name of corporation), a
corporation, and that said document was signed by him/her in behalf of said corporation
by authority of its bylaws or of a Resolution of its Board of Directors, and he/she
acknowledged to me that said corporation executed the same.

Notary Public

END OF DOCUMENT 00 61 13

DOCUMENT 00 6114

PAYMENT BOND

PART 1 GENERAL

1.1 BOND

- A. Number: _____
- B. Amount: _____
- dollars and _____ cents (\$ _____)

1.2 SURETY

- A. Name: _____
- B. Address: _____
- C. City, State, Zip: _____
- D. Telephone: _____
- E. Facsimile: _____

1.3 CONTRACTOR

- A. Name: _____
- B. Address: _____
- C. City, State, Zip: _____
- D. Telephone: _____
- E. Facsimile: _____

1.4 OWNER

- A. OWNER: West Valley City Corporation, a municipal corporation of the State of Utah,
 3600 South Constitution Blvd, West Valley City, Utah 84119.

1.5 CONSTRUCTION PROJECT

- A. Project Name: **Sunset Hills Park**
- B. Project No: **WVC-PR-P006**

1.6 DEFINED TERMS

- A. Terms used in this Performance Bond that 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, not 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:
 - 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; and
 - 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 OBLIGATIONS

- 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.
- B. Should there be a default of the SURETY under the terms of this Bond or should the SURETY in any way fail to act as required under the terms of this Bond and the Agreement, as determined by a court of competent jurisdiction, the SURETY shall be directly obligated to pay any and all costs, expenses, and any other damages flowing to the CITY, including, but not limited to, court costs and attorneys fees (whether such fees be the result of in-house or outside counsel), plus interest thereon, irrespective of whether such costs, expenses, damages and interest exceed the limit of the amount of this Bond.

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 City of West Valley, State of Utah.

2.11 COPIES OF THE 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.

2.12 ATTORNEY'S FEES

- A. In the event there is a failure to perform under this Agreement and it becomes reasonably necessary for any party to employ the services of an attorney in connection therewith (whether such attorney be in house or outside counsel), either with or without litigation, on appeal or otherwise, the losing party to the controversy shall pay to the successful party reasonable attorneys fees incurred by such party, and, in addition, such costs and expenses as are incurred in enforcing this Agreement.

PART 3 EXECUTION

3.1 EFFECTIVE DATE

- A. Surety and CONTRACTOR executed this Bond Agreement and declared it to be in effect as of _____ day of _____, 20 _____.

3.2 CONTRACTOR'S SUBSCRIPTION AND ACKNOWLEDGEMENT

- A. Type of organization: _____
(corporation, partnership, individual, etc.)
- B. If CONTRACTOR is a corporation, attach a corporate resolution evidencing CONTRACTOR'S authority to sign.
- C. CONTRACTOR'S signature: _____
- D. Please print name here: _____
- E. Title: _____
- F. Corporate Acknowledgement:

In the County of _____, State of _____, on
the _____ day of _____, 20 _____, personally appeared
before me _____ (name of person),
whose identity is personally known to me or proved to me on the basis of satisfactory
evidence, and who affirmed that he/she is the _____ (title)
of _____ (name of corporation), a
corporation, and that said document was signed by him/her in behalf of said corporation
by authority of its bylaws or of a Resolution of its Board of Directors, and he/she
acknowledged to me that said corporation executed the same.

Notary Public

3.3 SURETY'S SUBSCRIPTION AND ACKNOWLEDGEMENT

- A. Attach evidence of Surety's corporate authority to sign.
- B. Surety's signature: _____
- C. Please print name here: _____
- D. Title: _____
- E. Acknowledgement:

In the County of _____, State of _____, on
the _____ day of _____, 20 _____, personally appeared
before me _____ (name of person),
whose identity is personally known to me or proved to me on the basis of satisfactory
evidence, and who affirmed that he/she is the _____ (title)
of _____ (name of corporation), a
corporation, and that said document was signed by him/her in behalf of said corporation
by authority of its bylaws or of a Resolution of its Board of Directors, and he/she
acknowledged to me that said corporation executed the same.

Notary Public

END OF DOCUMENT 00 61 14

CERTIFICATE OF INSURANCE

PART 1 GENERAL

1.1 PROCEDURE

- A. For filing purposes, add *Certificates of Insurance* to the Contract Documents following this page.
- B. Certificate of Insurance must include the following information in addition to the standard information:
 - 1. **Sunset Hill Park; Project # WVC-PR-P006**
 - 2. Cancellation: the cancellation section should read as follows: Should any of the above described policies be cancelled before the expiration date thereof, the issuing company will mail 30 days written notice to the certificate holder named.”
 - 3. Commercial General Liability: CONTRACTOR shall secure and maintain during the life of the Construction Contract and at all times thereafter when CONTRACTOR may be correcting, removing or replacing Defective Work, commercial general liability and property damage insurance policy. The policy shall protect the CONTRACTOR, the OWNER, the ENGINEER, and any Subcontractor performing work covered by the Construction Contract from claims for damages for personal injury, including accidental death, and from claims for property damage which may arise from CONTRACTOR’S operations under this Construction Contract, whether such operations be by itself or by any Subcontractor or by anyone directly or indirectly employed by either of them. Unless specified otherwise in the supplementary Conditions, the minimum amounts of such insurance for each occurrence shall be \$3,000,000.00 per project aggregate limit. The insurance for this Project is not required to include specific insurance for environmental liabilities.
 - 4. Automobile Liability Insurance: Whenever CONTRACTOR or any Subcontractor shall use and operate automobiles, trucks or other vehicles on public streets and highways in complying with the terms and conditions of the Construction Contract, CONTRACTOR or each Subcontractor shall carry automobile liability insurance with limits not less than \$2,000,000.00 for any on accident or loss.

END OF DOCUMENT 00 62 16

CONDITIONS OF THE CONTRACT

DOCUMENT 00 7303

MODIFICATIONS TO GENERAL CONDITIONS
(Supplementary Conditions)

This Document amends the provisions specified in the General Conditions (Document 00 72 00) in the Manual of Standard Specifications published by the Utah Chapter of the 2017 Edition American Public Works Association.

Add the following paragraph:

3.6 COPIES OF DOCUMENTS

A. OWNER shall furnish to CONTRACTOR the number of copies of the Contract Documents as are reasonably necessary for the execution of the Work (up to 3 copies) unless additional copies are provided for in the Specifications. Additional copies will be furnished upon request, at the cost of reproduction.

B. OWNER shall not furnish to CONTRACTOR the 2017 Edition Manual of Standard Plans, the 2017 Edition Manual of Standard Specifications, the current edition of MUTCD, and the Traffic Control Manual published by the Utah Chapter of APWA. The CONTRACTOR shall purchase such documents separately.

C. Copies of all Contract Documents including the 2017 Edition Manual of Standard Plans, the 2017 Edition Manual of Standard Specifications shall be provided on site by the CONTRACTOR.

Substitute the following in Part 5:

5.1 PERFORMANCE, PAYMENT AND OTHER BONDS

A. Prior to OWNER executing the Agreement, CONTRACTOR shall file with the OWNER a good and sufficient Performance Bond and a Payment Bond, each in the sum of not less than 100 percent of the Contract Price.

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 named in the current list of Companies holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies as published in current Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department, with an underwriting limitation

equal to or greater than the Contract Price which the Bond guarantees or with a current “A-” rating or better in A.M. Best Co., Inc.’s, Best Insurance Reports, Property and Casualty Edition.

C. Said Bonds shall guarantee the faithful performance of the Construction Contract by the CONTRACTOR and payment of labor and materials. They 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. 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.

Article 5.2 of the General Conditions is hereby repealed and the following is substituted therefore:

5.2 INSURANCE

A. In General: All policies of insurance provided shall be issued by insurance companies qualified to do business in the State of Utah and listed on the U.S. Treasury Department’s current Department of Treasury Fiscal Services List 570, or having a general policy holder’s rating of not less than “A-VII” in the most current available A. M. Best Co., Inc.’s Best’s Insurance Report. CONTRACTOR shall furnish copies of certificates of insurance concurrent with or prior to the signing of the Agreement. The certificates shall name the OWNER, its officers, officials, employees or volunteers as additional insured. If requested, CONTRACTOR shall also furnish copies of the insurance policies secured for the Work.

B. Worker’s Compensation Insurance: In addition to other required insurance, the CONTRACTOR shall obtain and maintain during the life of the Construction Contract, worker’s compensation insurance as required by Laws and Regulations for all of CONTRACTOR’S employees employed at the site of the Work, and in case any work is subcontracted, the CONTRACTOR shall require the Subcontractor similarly to provide worker’s compensation insurance for all the latter’s employees, unless such employees are covered by protection as required by Laws and Regulations.

C. Commercial General Liability: CONTRACTOR shall secure and maintain during the life of the Construction Contract and at all times thereafter when CONTRACTOR may be correcting, removing or replacing Defective Work, commercial general liability and property damage insurance policy. The policy shall protect the CONTRACTOR, the OWNER, the ENGINEER, and any Subcontractor performing work covered by the Construction Contract from claims for damages for personal injury, including accidental death, and from claims for property damage which may arise from CONTRACTOR’S operations under this Construction Contract, whether such operations be by itself or by any Subcontractor or by anyone directly or indirectly employed by either of them. Unless specified otherwise in the supplementary Conditions, the minimum

amounts of such insurance for each occurrence shall be \$3,000,000.00 per project aggregate limit. The insurance for this Project is not required to include specific insurance for environmental liabilities.

D. Automobile Liability Insurance: Whenever CONTRACTOR or any Subcontractor shall use and operate automobiles, trucks or other vehicles on public streets and highways in complying with the terms and conditions of the Construction Contract, CONTRACTOR or each Subcontractor shall carry automobile liability insurance with limits not less than \$2,000,000.00 for any on accident or loss.

E. Insurance Non-cancelable for 30 Days: Each policy of insurance provided in the Contract Documents shall be absolutely non-cancelable for a period of not less than 30 days after notice and shall contain the following provisions or one substantially the same as the following: "This Policy shall not be subject to cancellation, change, or reduction of coverage by the other party or parties hereto, unless notice, as defined herein is sent to the OWNER, with a copy of the ENGINEER and the OWNER."

F. Builder's Risk: Builder's Risk ~~is~~ required on this project. If required please read:

1. CONTRACTOR agrees to and assumes the risk of loss for any damage or loss to the Work and Project by any means or occurrence until Substantial Completion. CONTRACTOR further agrees to obtain builder's risk or course of construction insurance in the total amount of the replacement cost.

G. Deductible and Self-Insured Retention: Any deductibles or self-insured retention must be declared to and approved by the OWNER. At the option of the OWNER, either: the insurer shall reduce or eliminate such deductibles or self-insured retention as respects the OWNER, its officers, officials, employees and volunteers; or the CONTRACTOR shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

H. Other Insurance Provisions: The policies are to contain, or be endorsed to contain, the following provisions:

1. Commercial General Liability and Automobile Liability Coverage:

- a. The OWNER, its officers, officials, employees and volunteers are to be covered as insured's as respects: liability arising out of activities performed by the insured's general supervision of the CONTRACTOR; products and complete operations of the CONTRACTOR; premises owned, occupied or used by the CONTRACTOR; or automobiles owned, not owned, lease, hired or borrowed by the CONTRACTOR. The coverage shall contain no special limitations on the scope of protection afforded to the OWNER, its officers, officials, employees or volunteers.
- b. The CONTRACTOR'S insurance coverage shall be primarily insurance as respects the OWNER, its officers, officials, employees or volunteers. Any insurance or self-insurance maintained by the OWNER,

its officers, officials, employees or volunteers shall be excess of the CONTRACTOR'S insurance and shall not contribute with it.

c. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the OWNER, its officers, officials, employees or volunteers.

d. The CONTRACTOR'S insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

2. Worker's Compensation and Employers Liability Coverage: To the extent permitted by law, the insurer shall agree to waive all rights of subrogation against the OWNER, its officers, officials, employees or volunteers for losses arising from work performed by the CONTRACTOR for the OWNER.

3. All Coverage: Each policy of insurance provided in the Contract Documents shall be endorsed with a provision or provisions stating the policy shall be absolutely non-cancelable, suspended, voided or subject to change or reduction of coverage by the other party or parties hereto, for a period of not less than thirty (30) days after written notice by certified mail, return receipt requested, has been given to the OWNER, with a copy to the ENGINEER and to the OWNER.

- I. Verification of Coverage: CONTRACTOR shall furnish the OWNER with certificates of Insurance and with original endorsements effecting coverage required by the clause. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates and endorsements are to be on forms provided or approved by the OWNER. Where by statute, the OWNER'S workers' compensation-related forms cannot be used, equivalent forms approved by the Insurance Commissioner are to be substituted. All certificates and endorsements are to be received and approved by the OWNER prior to or concurrent with the execution of the Agreement by the CONTRACTOR. The OWNER reserves the right to require complete, certified copies of all required insurance policies at any time.
- J. Subcontractors: CONTRACTOR shall include all subcontractors as named insured's under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverage for subcontractors shall be subject to all of the requirements stated herein.

6.16 Contractor's General Warranty and Guarantee

E. The Contractor warrants to the City that materials, equipment, and systems furnished under the Contract will be new and of good quality, that the work will be free from defects in quality and workmanship, and that the work will conform to the requirements of the Contract Documents. If, within one year after the date of **Substantial Completion** any of the work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Project Manager. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage.

1. At the conclusion of the one year warranty period, a final project acceptance inspection will be performed by the City.
2. Any items needing repair or replacement will then be performed by the Contractor without additional charge or cost to the City.
3. Once all work is complete, City will release all bonds.

END OF DOCUMENT 00 73 03

DOCUMENT 00 9113

ADDENDA AND MODIFICATIONS

PART 1 GENERAL

1.1 PROCEDURE

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

END OF DOCUMENT 00 91 13

SUPPLEMENTAL AND SPECIAL PROVISIONS

Sunset Hills Park

SECTION 01 00 00
GENERAL REQUIREMENTS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Sections, shall apply to all work stated in this and subsequent sections.
- B. Separation of the specifications into divisions and sections is for convenience only and is not intended to establish limits of work.
- C. The Specifications (divisions/sections) and Drawings are complimentary, and what is called for by any one shall be as binding as if called for by all. Anything not expressly set forth in either, but which is reasonably implied, shall be furnished and performed the same as if it were both shown and mentioned. It is the intention of the documents to include all labor and materials, equipment, and transportation necessary to complete the work shown or indicated by the drawings or called for in the specifications, in accordance with the best practices prevailing for the work of the various kinds. Materials or work described in words or those which are implied and having a well known trade or technical meaning, shall be held to refer to recognized standards.

1.2 DEFINITIONS

- A. West Valley City Project Manager: Jason Erikson

West Valley City Parks and Recreation
3600 South Constitution Blvd.
West Valley City, Utah 84119
(801) 955-4006
 - 1. The person designated by Parks & Recreation Division to act in its behalf shall have authority to transmit instructions, receive information, interpret and define policy and decisions, with respect to materials, equipment, elements and systems pertinent to proper execution of the work and hereafter be known as the **Project Manager**.

1.3 PROCEDURES

- A. This Contractor shall provide all items, materials, operations and methods including all labor, equipment and incidentals necessary for the successful completion of the project.
- B. This Contractor shall be duly licensed for the work involved and shall secure all building permits and certificates, and obtain all inspections as might be required for the proper prosecution of the work.
- C. This Contractor should visit the site prior to submitting a bid to adequately determine the scope, intent and requirements of the project and its satisfactory completion.

1.4 QUALITY ASSURANCE

- A. A Pre-Construction conference will be held before the start of any work, with the Contractor and Project Manager, to review the drawings, specifications, and applicable requirements pertaining to the work and to establish mutual understanding of procedures and precautions related to the proper prosecution of the work.
- B. The City reserves the right to reject any or all sub-contractors who have previously performed unsatisfactorily for the City or who do not meet the requirements specified in

other sections of these specifications.

1.7 PRODUCTS

- A. Materials used by the Contractor or any Sub-contractor shall be new, unless noted otherwise, and shall be of specified quality and furnished in sufficient quantity to facilitate proper and speedy execution of the work. Materials must be delivered to the site in original packaging with labels and trademarks intact.

1.9 SUBMITTALS

- A. Submittal Procedure
 - 1. Review submittals prior to transmittal. Determine and verify field measurements, field construction criteria, manufacturer's catalog numbers, and conformance of submittal with requirements of Contract Documents.
 - 2. Coordinate submittals with requirements of Work and of Contract Documents.
 - 3. Sign or initial each sheet of shop drawings and product data, and each sample label to certify compliance with requirements of Contract Documents. Notify Project Manager in writing at time of submittal, of any deviations from requirements of Contract Documents.
 - 4. Do not fabricate products or begin work that requires submittals until return of submittal with Project Manager acceptance.
 - 5. Transmit submittals to Project Manager under transmittal form. Submit the number of copies that Contractor requires, plus the number of copies required by Project Manager.
 - 6. Comply with submittal sequences shown in the progress schedule.
 - 7. When required by Laws and Regulations, affix licensed professional's stamp to submittal documents.
 - 8. Identify pertinent Drawing sheet and detail number, and Specification section number.
 - 9. Identify deviations from Contract Documents.
 - 10. Identify the date when Project Manager must complete review of submittal.
 - 11. After review of submittal, revise and resubmit as required, identifying changes made since previous submittal.
 - 12. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.
- B. Shop Drawings
 - 1. Present drawings in a clear and thorough manner. Title each drawing with Project name and number. Identify each element of drawings by reference to sheet number and detail or equipment schedule.
 - 2. Identify field dimensions. Show relation to adjacent or critical features or work or products.
 - 3. Provide sheet size adequate for Project Manager review.
- C. Product Data
 - 1. Submit only pages which are pertinent. Mark each copy of standard printed data to identify pertinent products, referenced to specification section and article number. Show reference standards, performance characteristics, and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions, And required clearances.
 - 2. Modify product data by deleting information that is not applicable to the Work or by marking each copy to identify pertinent data.
 - 3. Supplement standard information, if necessary, to provide additional information applicable to the Work.
 - 4. Provide manufacturer's preparation, assembly and installation instructions.
- D. Samples
 - 5. Submit 1 of each sample required by Contract Documents. Samples shall show

the quality, type, range of color, finish and texture of the material.

- D. Certificates
 - 1. Submit certificates, in duplicate, in accordance with requirements of each Specification section.

1.10 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

- A. Temporary Utilities
 - 1. The Contractor shall provide service required for construction operations
- B. Barriers and Enclosures
 - 1. Provide to prevent public entry to work areas and to protect existing trees and plants. Provide as required to protect existing facilities, improvements and adjacent properties from damage from construction operations. Repair damage at no cost to the City.
 - 2. Provide barriers around trees and plants designated to remain. Protect against vehicular traffic, stored materials, dumping, chemically injurious materials, and puddling or continuous running water.
 - 3. Provide protection against weather - rain, winds, storms, frost or heat so as to maintain all work free from injury or damage. New work shall be covered if necessary.
- C. Security
 - 1. Provide temporary protection for installed products. Control traffic in immediate area to minimize damage.
- D. Temporary Controls
 - 1. Surface Water, Erosion, and Sediment Control
 - a. Surface water shall be controlled so that the construction area is not allowed to become wet from runoff from adjacent areas. Surface water shall be directed away from these areas but not directed toward adjacent property, buildings, or any improvement that may be damaged by water. Surface water shall not be allowed to enter sanitary sewers.
 - b. Maintain excavations free of water. Provide and operate pumping equipment as needed.
 - c. Prevent erosion and sedimentation.
 - d. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
 - e. Provide and maintain public access road around the work area.
 - 2. Construction Cleaning:
 - a. All public and private areas used as haul roads shall be continuously maintained and cleaned of all construction caused debris such as mud, sand, gravel, soils, pavement fragments, sod, etc. Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately and the area cleaned.
 - b. Public roads shall be maintained in accordance with applicable ordinances and regulations.
 - c. Throughout all phases of construction, including suspension of work, and until final acceptance of the project, the Contractor shall keep the work site clean and shall remove daily all refuse, dirt, damaged materials, unusable materials, and all other trash or debris that he has created from his construction activities.
 - d. Materials and equipment shall be removed from the site as soon as they are no longer necessary; and upon completion of the work and before final inspection, the entire work site shall be cleared of equipment, unused materials, and rubbish so as to present a satisfactory, clean and neat appearance. All cleanup costs shall be included in the Contractor's bid.
 - 3. Dust Control:

- a. Dust control measures shall be implemented by application of water to all work areas, storage areas, haul and access roads, or other areas affected by construction.
 - b. All work shall be in compliance with the Federal, State, and local air pollution standards, and not cause a hazard or nuisance to personnel and the public in the vicinity of the work.
 - c. Provide positive means to prevent air-borne dust from dispersing into atmosphere.
 - d. Execute work by methods to minimize raising dust from construction operations.
- E. Traffic Regulation
 - 1. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and City's operations.
 - 2. Monitor parking of construction personnel's vehicles. Construction personnel will be restricted to parking in designated areas only.
 - 3. Prevent parking on or adjacent to access roads or in non-designated areas.
 - 4. Consult with authorities, establish public thoroughfares to be used for haul routes and site access.
 - 5. Confine construction traffic to haul routes and designated construction limits.

1.11 INSTALLATIONS

- A. The Contractor shall comply with all applicable safety ordinances, including required O.S.H.A. standards.
- B. Contractor shall be responsible for all cutting, fitting, and/or patching as may be required to complete the work or to make its several parts fit together properly. During the course of construction, every care shall be taken to prevent damage to existing buildings and landscape elements not a part of the contract. Any damaged areas shall be restored to a "like new" condition at no additional cost to the City.

1.12 PERMITS

- A. The Contractor will be responsible for securing all permits that may be required to complete the work.

1.13 FIELD ENGINEERING

- A. From information provided on the drawings and provided by the City as herein specified, the contractor shall establish grades, lines, and levels required for the completion of the work in accordance with the drawings and specifications. The Contractor shall be responsible for all site engineering and layout and shall provide construction staking as necessary. The Contractor shall be responsible for the accurate placement of improvements. Any inconsistencies or problems found during this work shall be reported to the Project Manager before proceeding with the work.

1.14 COORDINATION

- A. Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the project, any unfit person or anyone unskilled in the work assigned to him.
- B. The Contractor and Sub-contractor(s) shall coordinate their work with adjacent work of others and coordinate their efforts so as to facilitate the progress of the project. Each contractor shall afford the other contractor every reasonable opportunity for the installation and/or storage of their materials.

1.15 UTILITIES

- A. The locations of existing underground utilities depicted on the drawings are shown in an approximate way only. The Contractor shall determine the exact location of all existing utilities, whether or not shown on the drawings, before commencing work. Contractor agrees to be fully responsible for any and all damages which might be occasioned by his failure to exactly locate and preserve any and all underground utilities. If damaged or removed, the existing utility shall be restored or replaced by Contractor in as nearly the original condition and location as is reasonably possible, at no cost to the City.
- B. The Contractor shall notify all utility companies, including Blue Stake, whether identified on the site or not, of any required connections to, or modifications or abandonment of, existing lines and/or equipment during the execution of the work. The Contractor shall properly and timely notify each utility company involved so as to properly schedule the work and coordinate necessary inspections and acceptance.
 - 1. All such work shall be done in compliance with each utility company's requirements and standards.

1.16 CLEAN-UP

- A. Contractor shall at all times keep premises free from accumulations of waste materials or rubbish; shall immediately remove any demolition debris; and shall, at the completion of the work, leave the area clean and habitable with no additional maintenance work required by the City upon acceptance.

1.17 RECORD DOCUMENTS

- A. Contractor shall maintain one (1) copy of all drawings, specifications, addenda, field orders, approved shop drawings and change orders as "Record Documents".
 - 1. These documents shall be maintained in good condition and marked during construction so as to record all changes and modifications to the work and to document exact dimensions (from permanent features of the site), along with grades and elevations of all exterior and interior underground work, including conduit, piping, valves, and drains.
 - 2. At Substantial Completion of the project, documentation of changes, red-lines, and as-builts will be submitted to Project Manager for review and approval.

1.18 SUBSTANTIAL COMPLETION

- A. Substantial Completion: The point in time when the Work is sufficiently complete, in accordance with the Contract Documents, that the City can occupy or use the Work for its intended purpose. Substantial Completion shall be issued in writing by the Project Manager to the Contractor.
- B. Substantial Completion procedures:
 - 1. Before requesting substantial completion of the work from the Project Manager, Contractor shall have received approval on all building permit required inspections, as administered by the local governing municipality. The Contractor shall also supply proof of payment for all utility costs incurred during construction.
 - 2. Contractor shall have received written acceptance of Turf Establishment from Project Manager.
 - 3. The Contractor shall request in writing his intent to have the City review and accept the project as substantially complete.
 - 4. This request must be submitted to the Project Manager at least five (5) calendar days prior to the requested observation date in order to give those involved time to schedule attendance.
 - a. If the work is found not substantially complete, or if the list of incomplete

items is more than a few, the Contractor shall be charged for the time of those in attendance at this meeting. These monies shall be deducted from the amount due the contractor at the end of the project.

1.19 CLOSE OUT DOCUMENTS

- A. Submit the following Close-out Documents:
 - 1. One year warranty letter.
 - 2. Lien Waiver
 - 3. Record documents.
 - 4. Instruct City's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 - 5. Submit demonstration and training videotapes.

1.20 ONE YEAR WARRANTY PERIOD and FINAL PROJECT ACCEPTANCE

- A. The Contractor warrants to the City that materials, equipment, and systems furnished under the Contract will be new and of good quality, that the work will be free from defects in quality and workmanship, and that the work will conform to the requirements of the Contract Documents. If, within one year after the date of **Substantial Completion** any of the work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Project Manager. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage.
 - 1. At the conclusion of the one year warranty period, a final project acceptance inspection will be performed by the City.
 - 2. Any items needing repair or replacement will then be performed by the Contractor without additional charge or cost to the City.
 - 3. Once all work is complete, City will release all bonds.

END OF SECTION

SECTION 01 01 00

SUMMARY OF WORK

This Specification replaces a portion of 2017 Edition APWA Standard Specification Section 01 11 00. All other provisions of the Section remain in full force and effect.

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. The work for this project shall consist of, but not be limited to preparing the site and furnishing all labor materials, and equipment to complete the following improvements with quality workmanship, in a timely manner, and in compliance with project plans and specifications:
 - 1. Review and accept existing site conditions.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Work on this project consists of: the complete construction of a new city neighborhood park. Including: site clearing and grubbing, excavation and earth work, rough grading, top soil screening, irrigation system installation with controller, top soil placement, finish grading, sod/hydro-seed/drill seed turf, trees, shrubs, groundcover, concrete flatwork, concrete curbing, concrete retaining walls, pre-fabricated pavilion installation, playground installation, impact material installation, drainage system installation, lights and light piers, electrical system, electrical service (2), drinking fountain and park sign.

1.3 CONTRACT METHOD

- A. Construct the Work under a single unit price contract.
- B. Relations and responsibilities between CONTRACTOR and Subcontractors assigned by OWNER shall be defined in the Conditions of the Contract. Assigned Subcontractors shall, in addition:
 - 1. Furnish to CONTRACTOR bonds covering faithful performance of subcontracted work and payment of all obligations hereunder when CONTRACTOR is required to furnish such bonds to the OWNER.
 - 2. Purchase and maintain liability insurance to protect CONTRACTOR from
 - 3. claims for not less than the limits of liability that CONTRACTOR is required to provide to OWNER.

1.4 WORK BY OTHERS

- A. Adjacent work, which will be completed prior to start of Work of this Construction Contract:
 - 1. N/A

1.5 WORK SEQUENCE

- A. SUBMITTALS. Construct Work in stages to accommodate OWNER and public use of premises and facilities during construction as specified. Coordinate and submit Progress

Schedule (Section 01 32 16), Traffic Plans, and other required Submittals as specified herein. Do not begin construction prior to acceptance of submittals as required.

- B. WORK STAGING. Construct Work in stages to provide for continuous public usage.
- C. Do not close off public usage of facilities until usage of one stage of Work will provide alternate usage. Closure of roads to through traffic is allowed only with prior written consent from the ENGINEER. Road closures must be identified and addressed in the CONTRACTOR Traffic Control Plan. Maintain access to individual dwellings for OWNER, public, mail service, garbage pickup, and emergency access as specified. Roads opened to through traffic prior to final surface restoration (asphalt paving), must have an approved temporary road surfacing. CONTRACTOR shall maintain all temporary surfacing, including snow removal and re-grading as necessary, until final surfacing is completed.

1.6 CONTRACTOR USE OF PREMISIS

- A. CONTRACTOR shall limit use of premises for Work, for storage, and for access, to allow:
 - 1. OWNER occupancy
 - 2. Public usage
 - 3. Emergency vehicle access
 - 4. Pedestrian access
 - 5. Garbage Pickup
 - 6. Mail Delivery
- B. Coordinate use of premises under direction of ENGINEER.
- C. CONTRACTOR shall be fully responsible for protection and safekeeping of products
- D. Under this Construction Contract until construction completion and acceptance.
- E. The following areas have been identified for CONTRACTOR'S use:
 - 1. Public Right-of-Way as shown on the drawings
- F. The CONTRACTOR shall confine his operations to the Public Right-of-Way. CONTRACTOR shall obtain and pay for use of additional storage or work areas needed for operations under this Construction Contract. All use of private property used for storage, mobilization, office support, and/or any other CONTRACTOR operation shall be by private agreements. These private agreements shall be without any responsibility or liability on the part of the OWNER or ENGINEER, and all documents and payment shall be strictly between the private property owner and the CONTRACTOR. Provide copies of any private property use agreements to ENGINEER upon request.
- G. Use of the Public Right-of-Way in no way relieves the CONTRACTOR from maintaining access to all dwellings along the construction route. A minimum of one lane in each direction shall be maintained at all times for public and municipal service access for fire, police, mail, etc. except as specified herein. CONTRACTOR shall restore and clean all disturbed property as specified.

1.7 OWNER OCCUPANCY

- A. A.OWNER will occupy premises during entire construction period for conduct of OWNER's normal operations. Cooperate with OWNER in scheduling operations to minimize conflict and to facilitate OWNER usage.

END OF SECTION

SECTION 01 1400

WORK RESTRICTIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Conditions affecting construction.

1.2 EXISTING CONDITIONS

- A. The east roadway is fairly narrow and there are currently no parking signs present along roadway. We will work with HOA to allow some construction parking, making sure roadway is not blocked to other traffic.

1.3 SITE CONDITIONS

- A. Storage: There should be adequate area on site for construction staging, material and equipment storage, employee parking etc. Do not store equipment or materials in the public right of way.
- B. Soil Conditions: No unusual soil conditions should exist. There is some fill material on-site.
- C. In inclement weather, mud is to be expected. Consider existing conditions in preparing bid prices, work schedules and in protecting and moving equipment. Contractor is responsible to keep adjacent streets and project areas clean from mud tracking.
- G. Prior to the start of construction, ENGINEER will perform a topographical survey of the site to determine the existing ground contours. Commencing excavation operations is evidence the CONTRACTOR accepts OWNER'S survey of the site.

1.4 DRAINAGE

- A. Control all water impacting the work site during construction. Provide drainage protection of existing facilities. In the event of rain, maintain drainage lines to insure no flooding, the integrity of trenches, and stability of existing excavations.
- B. Control and maintain all irrigation tail water that currently drains onto street or into existing storm drain system.

1.7 TREE PROTECTION PLAN

- A. A tree protection plan is not required.

1.9 BURIED STREET AND PARKING LOT LIGHT WIRE

- A. Visit the site and verify whether street light wires are overhead or underground.
- B. Repair at no cost to the OWNER any CONTRACTOR caused damage to buried or overhead street and parking lot lighting wiring.

1.12 TRAFFIC RESTRICTIONS

- A. *None*

PART 2 PRODUCTS Not used.

PART 3 EXECUTION Not used.

END OF SECTION 01 14 40

**SECTION 01 23 00
ALTERNATES**

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Sections, shall apply to all work stated in this and subsequent sections.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

- A. Alternate: an amount proposed by bidders and stated on the Bidding Schedule for work that may be added to or deducted from the base bid amount if Owner decided to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1.3 PROCEDURES

- A. Coordination: revised or adjust affected adjacent work as necessary to completely integrate work of the alternate into project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Execute accepted alternates under the same conditions as other work of the contract.
- C. Schedule: a schedule of alternates in included at the end of this section.

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate No.1: Basketball Court Paving
 - 1. Base Bid: standard concrete paving
 - 2. Deductive Alternate: substitute Asphalt Paving (3" asphalt over 8" compacted road base) for basketball court.
- B. Alternate No.2: Asphalt Sidewalk Paving
 - 1. Base Bid: standard concrete paving
 - 2. Deductive Alternate: substitute Asphalt Paving (3" asphalt over 10" compacted road base) in areas shown on drawings.
- C. Alternate No.3: Maze
 - 1. Base Bid: seed mix and related irrigation system improvements
 - 2. Additive Alternate: concrete paving and related irrigation and landscaping improvements shown on drawings.
- D. Alternate No.4: Skate Element-1
 - 1. Base Bid: seed mix and related irrigation system improvements
 - 2. Additive Alternate: concrete paving and skate element as shown on drawings.

- E. Alternate No.5: Skate Element-2
 - 1. Base Bid: standard concrete paving
 - 2. Additive Alternate: skate element as shown on drawings.

END OF SECTION

SECTION 01 3113

COORDINATION

This Specification changes a portion of 2017 Edition APWA Standard Specification Section 01 31 13. All other provisions of the Section remain in full force and effect.

PART 1 GENERAL

1.2 COORDINATING WITH ENGINEER

Add the following paragraph to 1.2:

- F. Project Meetings: The CONTRACTOR shall hold weekly coordination meetings at a time and place as mutually agreed to by the CONTRACTOR and ENGINEER. The meetings shall include the project superintendent and other necessary personnel from the CONTRACTOR and personnel from the ENGINEER. In addition, the meeting may include, at the discretion of the ENGINEER, representatives from other utilities and the public. The CONTRACTOR shall present project status and coordination issues, and provide a progress schedule update. The weekly meetings are considered incidental to the project and no separate payment will be made.

Meetings may be skipped upon mutual decision between the CONTRACTOR and the ENGINEER.

Add the following article:

1.8 PUBLIC AGENCY PERSONNEL TO CONTACT

- A. Utility Companies: Utility companies generally require a minimum of 48 hours notice if their utility requires location, relocation, or protection. Contact the following individuals to coordinate.
1. Questar Gas: Joyce Jacobsen – 324-3957. Call 2 weeks prior to having Questar work on gas mains and 1 week on service lines to property owners. A Questar representative must be present at the preconstruction meeting and when working around high pressure gas mains.
 2. Rocky Mountain Power: Builder's Hotline – 1-800-469-3981
 3. Qwest Communications: Matt Ivester – 974-8169
 4. Granger-Hunter Improvement District: Doug Bradfield – 801-955-2228
 5. Comcast: Marty Pollock – 401-3032
 6. Salt Lake County Surveyor: Pamela Birt – 468-2016 (Survey Monuments)
 7. Traffic Signal (Coordinate with Salt Lake County): James Nell – 557-9698
 8. Utah Transit Authority (UTA): Michael Clara – 262-5626 ext. 2325

B. West Valley City

1. Schedule Engineering Inspections: 801-963-3318
2. Parks Department Project Representative: Jason Erekson – 801-955-4006
3. Parks Department Inspector: Kelly Simper – 801-955-7382
4. City Engineer: Dan Johnson – 801-963-3228
5. West Valley City Traffic Engineer: Erik Brondum – 801-963-3561
6. Excavation Permits/Street Closure: Randy Petersen – 801-963-3350
7. Fire: 801-963-3367
8. Police: 801-963-3300
9. West Valley City Sanitation Division: 801-955-3720

END OF SECTION 01 31 13

SECTION 01 3216

PROGRESS SCHEDULE

PART 1 GENERAL

1.3 SUBMITTALS

Add the following:

- D. OWNER will withhold payment if CONTRACTOR fails to prepare, submit, or update the Progress Schedule as required.

END OF SECTION 01 32 16

SECTION 01 3300

SUBMITTAL PROCEDURE

This specification changes a portion of 2017 Edition APWA Standard Specification Section 01 33 00. All other provisions of the Section remain in full force and effect.

PART 1 GENERAL

1.3 PROCEDURE

Add the following paragraph:

- J. Owner will withhold payment if contractor fails to prepare, submit or update submittals, as required.

1.8 SUBMITTALS

Add the following section:

- A. If CONTRACTOR submits documents for product other than that specified, provide a written statement to ENGINEER noting such (See Transmittal Form).
- B. Use the following list to identify CONTRACTOR's due dates and Engineers actions dates:

SUBMITTAL ACTION AND DUE DATE LIST

Submittal	Section Reference	When Due
Submittal Register	01 33 00	Pre-Construction Conference
Preliminary Progress Schedule	00 72 00	Pre-Construction Conference
Mobilization Plan	00 72 00	Pre-Construction Conference
Safety and Protection Plan	00 72 00	Pre-Construction Conference
Quality Control Program	00 72 00	Pre-Construction Conference
Copy of NOI (Notice of Intent Submitted to the Division of Water Quality, Department of Environmental Quality)	01 57 20	Pre-Construction Conference
SWPPP (Storm Water Pollution Prevention Plan)	01 57 20	Pre-Construction Conference
Copy of West Valley City Stormwater Permit	01 57 20	Pre-Construction Conference
Copy of NOT (Notice of Termination Submitted to the Division of Water Quality, Department of Environmental Quality)	01 57 20	Prior to Final Payment
Permits for Work	01 14 00	Prior to Starting Work
Traffic Control Plan	01 55 26	72 Hours Prior to Starting Work
Construction Land Surveyor Name, Address Registration No.	01 71 23	72 Hours Prior to Starting Work
Progress Schedule	01 32 16	With Each Monthly Pay Request
Written Permission to use Private Citizen's Property and Water	00 73 03	24 Hours Prior to Use
Common Fill	31 05 13	Prior to Delivery to Site
Crushed Aggregate Base	32 11 23	5 Days Prior to Placement
Crushed Aggregate Base Mix Design	32 11 23	5 Days Prior to Use
Asphalt Concrete Mix Design	32 12 05	5 Days Prior to Use
Asphalt Concrete Batch Delivery Ticket	32 12 16	Upon Delivery to Site
Portland Cement Concrete Source Data and Supplier's Mix No.	03 30 04	5 Days Prior to Use
Water System Product Data	33 11 00	5 Days Prior to Installation
Water System Disinfection Report	33 13 00	Prior to Water Line Use
Pipeline Commissioning	33 08 00	Prior to System Use
Portland Cement Concrete Quality Control Test Reports	03 30 04 03 30 10	Daily as applicable
Portland Cement Concrete Batch Delivery Ticket	03 30 10	Upon Delivery to Site
Portland Cement Concrete Curing Compound Source, Type, and Data	03 39 00	72 Hours Prior to 1 st Concrete Placement
Top Soil Supplier and Source Data	31 05 13	72 Hours Prior to Placement
Certification of Compliance and Request for Final Inspection	01 78 50	5 Working Days Prior to Substantial Completion
Quantity of Unclassified Excavation	31 23 16	Prior to Final Payment
Land Survey Closeout Documentation	01 71 23 01 71 34 31 05 10	Prior to Final Payment
Evidence of Payment to Suppliers and Subcontractors	01 78 50	Prior to Final Payment
Redlines	01 78 39	Prior to Final Payment

1. Notes: Section reference listed in this table but not found in the Project Manual may be found in the APWA Standard Specifications 2017 Edition.

1.9 ENGINEER'S STAMP

A. Form of the ENGINEER's stamp is as follows:

<u>SUBMITTAL REVIEW</u>	
☐ NO EXCEPTIONS TAKEN	☐ REJECTED
☐ MAKE CORRECTIONS NOTED	☐ RESUBMIT
☐ SUBMIT SPECIFIED ITEM	☐ DO NOT RESUBMIT
This review is for general conformance with the design concepts of the Work and general compliance with the Contract Documents and does not constitute an approval or variance. Corrections or comments, or the failure to make them, on this review does not relieve the CONTRACTOR from full contract compliance. The CONTRACTOR is responsible for compliance with all contract provisions, dimensions, sizes, capacities, fabrication and construction techniques, installation, coordinating work with others, and performing the Work in a safe and satisfactory manner. Date: _____ By: _____ WEST VALLEY CITY PARKS AND RECREATION	

B. Meaning of ENGINEER's Stamp:

1. No Exceptions Taken: Submittals have been reviewed and no corrections were noted.
2. Make Corrections Noted: Submittals that have only minor discrepancies. Resubmission will not be required unless the stamp is marked "Resubmit".
3. Submit Specified Item: Submittals that are incomplete or require more than minor corrections will be annotated to indicate necessary corrections. Resubmit the part of the submittal showing the corrections.
4. Rejected: Submittals that are fundamentally in error, covering wrong equipment or construction, or require extensive corrections.
5. Resubmit: Submittals that require resubmission. Make corrections required, note any changes by dating the revisions to correspond with the change require date, and resubmit the corrected materials.
6. Do Not Resubmit: Submittals which are not necessary to resubmit.

TRANSMITTAL FORM					DATE:	☐ NEW SUBMITTAL ☐ RESUBMITTAL	
Section I REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS (this section will be initialed by the CONTRACTOR)							
TO:				FROM:		TRANSMITTAL NO.	
						PREVIOUS TRANSMITTAL NO.	
SPECIFIC SECTION NUMBER (See instructions)				CONTRACT TITLE:		CONTRACT NO.	
SUBMITTAL ITEM NO. a.	DESCRIPTION OF ITEM SUBMITTED (Type Size, model number, etc.) b.	SAMPLE OR CERTIFICATE (See instructions) c.	NO. OF COPIES d.	CONTRACT REFERENCE DOCUMENT		VARIATION (See instructions) g.	ENGINEER REVIEW CODE (See instructions) h.
				SPEC PARA. NO. e.	DRAWING SHEET NO. f.		
REMARKS				I certify that the above submitted items have been reviewed in detail and are correct and conform with the Contract Drawings and Specifications except as otherwise noted.			
				NAME AND SIGNATURE OF CONTRACTOR			
Section II OWNER'S ACTION (this section will be completed by the ENGINEER)							
ENCLOSURES RETURNED (List by Item. No.)				SIGNATURE OF REVIEWING AGENT			DATE

FORM 013301 (Read Instructions on the reverse side prior to initialing this form)

INSTRUCTIONS

GENERAL

1. Form is self-transmittal. Letter of transmittal is not required.
2. Submittals requiring expeditious handling will be submitted individually on this form.
3. ENGINEER's review of submittals does not release or relieve CONTRACTOR from complying with all requirements of the Contract Documents.

SECTION 1

1. TRANSMITTAL No.: Number each transmittal consecutively in the space entitled "Transmittal No.". This number will identify each submittal.
2. PREVIOUS TRANSMITTAL No.: Mark the box for re-submittal and insert the transmittal number of last submission as well as the new submittal number in the spaces provided. Each re-submittal will become a new transmittal.
3. SPECIFICATION SECTION No.: Cover only one specification section with each transmittal.
4. Column "a": For each entry on this form, the "SUBMITTAL ITEM No." will be the same as the SUBMITTAL ITEM No. indicated on the Submittal Register.
5. Column "c": When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate".
6. Column "g": CONTRACTOR will place a check mark in the "Variation" column when a submittal is not in accordance with the plans and specifications – also, a written statement to that effect shall be included in the space provided for "Remarks" or on a separate page.
7. Column "h": For each item reviewed, ENGINEER shall assign action codes as follows.

- | |
|---|
| <ol style="list-style-type: none">A. No Exceptions Taken.B. Make Corrections Noted. Resubmissions not required.C. Submit Specified Item.D. Rejected.E. ResubmitF. Do Not Resubmit. Receipt acknowledged.G. Will be returned by separate correspondence.H. Other (Specify). |
|---|

SUBMITTAL REGISTER					PROJECT TITLE LOCATION CONTRACTOR												NO.						
SCHEDULED ACTIVITY	SUBMITTAL ITEM NO.	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF SUBMITTAL	TYPE OF SUBMITTAL												REVIEW ACTION	CONTRACTOR NEED DATES			ENGINEER ACTION DATES		OTHER	
				SAMPLES	SHOP DRAWINGS	PARTS LIST	PRODUCT DATA	DESIGN DATA	SPECIFICATIONS	CERTIFICATES	INSTRUCTIONS	TESTING RESULTS	O&M MANUAL	OTHER	REVIEW REQUIRED BY	SUBMITTAL DATE	APPROVAL NEED BY	MATERIAL NEEDED BY	DATE RECEIVED	ACTION CODE			

INSTRUCTIONS

GENERAL

1. **CONTRACTOR to Complete Form:** Review the Contract Documents to insure completeness. Expand general category listings. Show individual entries on this form for each item.
2. **Resubmittals:** If a submittal is returned for correction, provide a new Submittal Identification Number. Identify the number on the submittal register and resubmit the information for review. Do not amend the data already contained on the submittal register.

SUBMITTAL REGISTER

1. **SCHEDULE ACTIVITY:** If an activity on the Progress Schedule is assigned to the submittal, place the schedule activity number in the “SCHEDULED ACTIVITY” column.
2. **SUBMITTAL ITEM No.:** Assign to each entry on the Submittal Register a sequential number in the “SUBMITTAL IDENTIFICATION (ITEM NUMBER)” column.
3. **REVIEW ACTION:** The “REVIEW ACTION” column identifies technical review responsibility of submittal. Review of all products and materials is the CONTRACTOR’s responsibility; however, certain specified submittals will also require ENGINEER for information.
 - a. If REVIEW ACTION Column is Blank: Identified submittal shall be approved by the CONTRACTOR and then submitted to the ENGINEER for information.
 - b. If the “ENGINEER” is Identified in the REVIEW ACTION Column: Identified submittals shall be first approved by the CONTRACTOR and then submitted to the ENGINEER for review.
4. **ENGINEER ACTION DATES:** This column is for ENGINEER’s use to record date submittal was received and the action code assigned in the submittal review process.

END OF SECTION 01 3300

SECTION 01 4219

REFERENCES

PART 1 GENERAL

1.1 REFERENCE STANDARDS

A. Industry standards

1. Except where Contract Documents include more stringent requirements, applicable construction industry standards (read APWA) have same force and effect as if bound or copied directly into Contract Documents to extent referenced. Such standards are made a part of Contract Documents by reference.
2. Comply with APWA standards in effect as of date of Contract Documents, unless specific date is specified.
3. Where compliance with two or more standards is specified, and standards may establish different or conflicting requirements for minimum quantities or levels, refer requirements that are different, but apparently equal, and uncertainties to City for final decision before proceeding. Quantity or quality levels shown or specified shall be the minimum provided or performed. Actual installation may comply exactly with minimum quantity or quality specified, or it may exceed minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum, as appropriate for context of requirements. Refer uncertainties to City for decision before proceeding.
4. Each entity engaged in construction on Project is required to be familiar with industry standards (APWA) applicable to that entity's construction activity. Copies of applicable standards are not bound with Contract Documents. Where copies of standards are needed for performance of a required construction activity, Contractor shall obtain copies directly from publication source.
5. Trade association names and titles of general standards are frequently abbreviated. Following acronyms or abbreviations, as referenced in Contract Documents, are defined to mean associated names. Names and addresses are subject to change and are believed to be, but are not assured to be, accurate and up to date as of date of Contract Documents.

AABC	American Air Balance Council, 1518 K St NW, Suite 503, Washington, DC 20005 (202) 737-0202
AAMA	American Architectural Manufacturers Assoc, 1540 K Street NW, Palantine, IL 60067 (708) 202-1350
AAN	American Association of Nurserymen, 1250 Eye St NW, Suite 500, Washington, DC 20005 (202) 789-2900
AASHTO	American Association of State Highway & Transportation Officials, 444 North Capitol St, Suite 249, Washington, DC 20001 (202) 624-5800
ACI	American Concrete Institute, P.O. Box 19150, 22400 West 7 Mile Rd, Detroit, MI 48219 (313) 532-2600
AGA	American Gas Assoc, 1515 Wilson Blvd, Arlington VA 22209 (703) 841-8400
AIA	American Institute Of Architects, 1735 New York Ave NW, Washington, DC 20006 (202) 626-7300

AISC	American Institute of Steel Construction, One East Wacker Drive, Suite 3100, Chicago, IL 60601-2001 (312) 670-2400
AISI	American Iron & Steel Institute, 1101 17 th St NW, Washington, DC 20036-4700 (202) 452-7100
AITC	American Institute of Timber Construction, 7012 South Revere Parkway #140, Englewood CO 80112 (303) 792-9559
AMCA	Air Movement & Control Assoc, 30 West University Dr, Arlington Heights, IL 60004 (312) 394-0150
ANSI	American National Standards Institute, 11 West 42 nd St, New York NY 10036 (212) 642-4900
APA	American Plywood Assoc, P.O. Box 11700 (98411, 7011 South 19 th St (98466), Tacoma, WA (206) 565-6600
ARI	Air Conditioning & Refrigeration Institute, 4301 Fairfax Drive, Suite 425, Arlington, VA 22203 (703)524-8800
ASHRAE	American Society of Heating, Refrigeration, & Air conditioning Engineers, 1791 Tullie Circle NE, Atlanta, GA 30329 (404) 636-8400
ASME	American Society of Mechanical Engineers, 345 East 47 th St. New York, NY 10017 (212) 705-7722
ASTM	American Society for Testing & Materials, 1916 Race St, Philadelphia, PA 19103 (215) 299-5400
AWI	Architectural Woodwork Institute, 13924 Braddock Road, Suite 100, P O Box 1550, Centreville, VA 22020 (703) 222-1100
AWPA	American Wood Preservers' Assoc, P O Box 286, Woodstock MD 21163-0286 (410) 465-3169
AWS	American Welding Society, 550 LeJeune Road NW, P O Box 351040, Miami, FL 33135 (305) 443-9353
AWWA	American Water Works Assoc, 6666 West Quincy Ave, Denver, CO 80235 (303) 794-7711
BHMA	Builders' Hardware Manufacturers Assoc, 355 Lexington Ave, 17 th Floor, New York NY 10017 (212) 661-4261
BIA	Brick Institute of America, 11490 Commerce Park Drive, Suite 300, Reston VA 22091 (703) 620-0010
CRI	Carpet & Rug Institute, P O Box 2084, Dalton, GA 30722 (706) 278-3176
CRSI	Concrete Reinforcing Steel Institute, 933 Plum Grove Rd, Schaumburg, IL 60173 (312) 517-1200
DHI	Door & Hardware Institute, 14170 Newbrook Drive, Chantilly, VA 22021 (703) 222-2010
EIMA	EIFS Industry Manufacturers Association, 2759 State Road 580, Suite 112, Clearwater FL 34621 (813) 726-6477
FM	Factory Mutual Research Organization, 1151 Boston-Providence Turnpike, Norwood, MA 02062 (617) 762-4300
GA	Gypsum Association, 810 First Street NE, Suite 510 Washington, DC 20002 (202) 289-5440
IEEE	Institute of Electrical & Electronic Engineers, 345 East 47 th St, New York, NY 10017 (212) 705-7900
LPI	Lightning Protection Institute, 33365 North Arlington Heights Road, Arlington Heights, IL 60004 (800) 488-6864
MFMA	Maple Flooring Manufacturers' Assoc, 60 Revere Dr, Suite 500, Northbrook, IL 60062 (708) 480-9138

NAAMM	National Association of Architectural Metal Manufacturers, 600 South Federal St, Suite 400, Chicago, IL 60605 (312) 922-6222
NEC	National Electric Code (from NFPA)
NEMA	National Electrical Manufacturer's Association, 2101 'L' St, NW, Washington, DC 20037 (202) 457-8400
NFPA	National Fire Protection Assoc, One Batterymarch Park, P O Box 9101, Quincy, MA 02269-9101 (80) 344-3555
NFRC	National Fenestration Rating Council, 1300 Spring Street, Suite 120, Silver Spring, MD 20910 (301) 589-6372
NSF	National Sanitation Foundation, 3475 Plymouth Rd, P O Box 1468, Ann Arbor, MI 48106 (313) 769-8010
NWWDA	National Wood Window and Door Association, 1400 East Touhy Ave, #G54, Des Plaines, IL 60018 (213) 299-5200
PCA	Portland Cement Assoc, 5420 Old Orchard Road, Skokie, IL 60077 (312) 966-6200
PCI	Prestressed Concrete Institute, 175 West Jackson Blvd, Chicago, IL 60604 (312) 786-0300
PEI	Porcelain Enamel Institute, 102 Woodmont Boulevard, Suite 360, Nashville, TN 38205 (615) 385-0758
SDI	Steel Door Institute, 30200 Detroit Road, Cleveland OH 44145 (216) 899-0010
SIGMA	Sealed Insulating Glass Manufacturers Association, 401 North Michigan Avenue, Chicago IL 60611 (312) 644-6610
SJI	Steel Joist Institute, 1205 48 th Avenue North, Suite A, Myrtle Beach, SC 29577 (803) 449-0487
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, 4201 Lafayette Center Drive, Chantilly, VA 22116 (703) 803-2980
SPIB	Southern Pine Inspection Bureau, 4709 Scenic Highway, Pensacola, FL 32504 (904) 434-2611
TCA	Tile Council of America, P O Box 326, Princeton, NJ 08542 (609) 921-7050
TPI	Truss Plate Institute, 583 D'Onofrio Drive, Suite 200, Madison, WI 53719 (608) 833-5900
UL	Underwriters Laboratories, 333 Pfingsten Rd, Northbrook, IL 60062 (708) 272-8800
WWPA	Western Wood Products Assoc, Yeon Building 522 SW 5 th Avenue, Portland OR 97204-2122 (503) 224-3930

- B. Federal Government agencies – Names and titles of federal government standard or specification producing agencies are often abbreviated. Following acronyms or abbreviations, as referenced in Contract Documents indicate names of standard or specification producing agencies of the federal government. . Names and addresses are subject to change and are believed to be, but are not assured to be, accurate and up to date as of date of Contract Documents.

CS	Commercial Standard (U>S> Department of Commerce), Government Printing Office, Washington, DC 20402 (202) 377-2000
DOT	Department of Transportation, 400 Seventh St SW, Washington, DC 20590 (202) 366-4000

EPA	Environmental Protection Agency, 401 'M' St SW, Washington, DC 20460 (202) 382-2090
FCC	Federal Communications Commission, 1919 'M' St NW, Washington, DC 20554 (202) 632-7000
FHA	Federal Housing Administration (U.S. Department of Housing and Urban Development), 451 Seventh ST SW, room 9158, Washington, DC 20201 (202) 708-1422
FS	Federal Specification (from GSA), Specification Unit (WFSIS), 7 th & D St SW, Washington, DC 20406 (202) 708-9205
GSA	General Services Administration, F St & 18 th St NW, Washington, DC 20405 (202) 472-1082
MIL	Military Standardization Documents (U.S. Department of Defense), Naval Publications & Forms Center, 5801 Tabor Ave, Philadelphia, PA 19120
OSHA	Occupational Safety & Health Administration (U.S. Department of Labor), 200 Constitution Ave NW, Washington, DC 20410 (202) 219-6091
PS	Product Standards of NBS (U.S. Department of Commerce), Government Printing Office, Washington, DC 20402 (202) 783-3238
USDA	U.S. Department of Agriculture, Independence Ave between 12 th and 14 th Sts SW, Washington, DC 20250 (202) 447-8732

1.2 GOVERNING REGULATIONS/AUTHORITIES

- A. Contact authorities having jurisdiction directly for information and decisions having bearing on the Work.
- B. Obtain copies of regulations required to be retained at Project site, available for reference by parties who have a reasonable need for such reference.

1.3 SUBMITTALS

- A. For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 PRODUCTS – Not used

PART 3 EXECUTION – Not used

END OF SECTION 01 4219

SECTION 01 4340

RESIDENT SUPERINTENDENT

This specification changes a portion of 2017 Edition APWA Standard Specification Section 01 43 40. All other provisions of the section remain in full force and effect.

PART 1 GENERAL

1.3 DUTIES IN GENERAL

- I. Traffic Control Plan. Assure the traffic control plan and updates are implemented and Traffic Control supervisor adheres to the requirements of Section 01 55 26 and modifications herein.
- J. Safety Plan. Assure CONTRACTOR's safety plan is implemented. Provide a safe working environment.
- K. Summary of Quantities Earned. ENGINEER keeps Summary of Quantities Earned. Review the records weekly for accuracy, sign and return to ENGINEER with disparities noted. Disparities shall be resolved within one week of discovery.
- L. Monitor the use of temporary utilities.
- M. Monitor periodic cleaning.
 - 1. Enforce compliance with specifications.
 - 2. Resolve any conflicts.
- N. Changes and Substitutions.
 - 1. Recommend desirable changes to ENGINEER.
 - 2. Review subcontractor and supplier requests for changes and substitutions, submit recommendations to ENGINEER.
 - 3. Promptly notify all subcontractors and suppliers of pending changes or substitutions.

END OF SECTION 01 4340

SECTION 01 4500

QUALITY CONTROL

PART 1 - GENERAL

1.1 SUMMARY

This Section specifies requirements for quality control services. Quality control services include inspections and tests performed by independent agencies, governing authorities, as well as the Contractor.

- A. Testing Responsibilities: Testing and inspecting services are required to verify compliance with requirements specified or indicated. **The owner shall engage and pay for services of an independent agency to perform inspections and tests specified in the schedule attached herein.** These services do not relieve Contractor of responsibility for compliance with the Contract Documents.
 - 1. Specified test, inspections and related actions do not limit Contractor's other quality-assurance and control procedures that facilitate compliance with Contract Documents.
 - 2. Requirements for Contractor to provide quality-assurance and control Services required by Architect, Owner or authorities having jurisdiction are not limited by provisions of this section.
- B. Retesting: The Contractor is responsible for retesting costs where results prove unsatisfactory and do not indicate compliance with Contract Documents, regardless of whether the original test was the Contractor's responsibility.
 - 1. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.
- C. Associated Services: The Contractor shall cooperate with agencies performing inspections or tests and provide auxiliary services as requested. Notify the agency in advance of operations to permit assignment of personnel. Auxiliary services include but are not limited to:
 - 1. Provide access to the Work and furnish incidental labor and facilities necessary to facilitate inspections and tests.
 - 2. Take representative samples of materials that require testing or assist the agency in taking samples.
 - 3. Provide facilities for storage and curing of samples, and deliver samples to testing laboratories.
 - 4. Provide a preliminary design mix proposed for use for material mixes that require control by the testing agency.
 - 5. Provide security and protection of samples and test equipment at the Project site.
- D. Duties of the Testing Agency: The agency engaged to perform inspections and testing of materials and construction shall cooperate with the Architect and Contractor in performance of its duties, and provide qualified personnel to perform inspections and tests.

1. The agency shall notify Owner and Contractor promptly of deficiencies observed during performance of its services.
 2. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.
- E. Coordination: This Contractor and each agency engaged to perform inspections and tests shall coordinate the sequence of activities to avoid removing and replacing construction to accommodate inspections and tests.
1. The Contractor is responsible for scheduling inspections, tests, taking samples and similar activities.
- F. Submittals: The testing agency shall submit a certified written report of each inspection and test to the Owner, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible, submit a certified written report of each inspection and test through the Contractor, in duplicate. Submit additional copies of each report to the governing authority, when the authority so directs.
- G. Report Data: Written reports of each inspection or test shall include, but not be limited to:
- Date of issue
 - Project title and number
 - Name, address and telephone number of testing agency
 - Dates and locations of samples and tests or inspections
 - Names of individuals making the inspection or test
 - Designation of the Work and test method
 - Identification of product and Specification Section
 - Complete inspection or test data
 - Test results and an interpretation of test results
 - Ambient conditions at the time of sample taking and testing
 - Comments or professional opinion as to whether inspected or tested work complies with Contract Document requirements
 - Name and signature of laboratory inspector
 - Recommendations or retesting
- H. Qualifications for Service Agencies: Engage inspection and testing agencies which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and specialize in the types of inspections and tests to be performed. Each inspection and testing agency engaged shall be authorized to operate in the State in which the Project is located.
- I. Repair and Protection: Upon completion of inspection and testing repair damaged construction and restore substrates and finishes to eliminate deficiencies. Comply with requirements for "Cutting and Patching". Protect construction exposed by or for quality control service activities and protect repaired construction. The Contractor is responsible for repair and protection regardless of the assignment of responsibility for inspection and testing.

PART 2 - SCHEDULE OF CONTRACTOR PROVIDED TESTING SERVICES

- A. Earthwork: Allow testing service to inspect and approve each subgrade and fill layer before further backfill or construction work is performed. Perform field density tests in accordance with ASTM D 1556 (sand cone method) or ASTM D 2167 (rubber balloon method), as applicable.
1. Field density tests may also be performed by the nuclear method in accordance with ASTM D 2922, providing that the calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. In conjunction with each density calibration check, check the calibration curves furnished with the moisture gages in accordance with ASTM D 3017.
 2. If field tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Project Architect.
- B. Footing Subgrade: For each strata of soil on which footings will be placed, perform at least one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata when acceptable to Project Architect.
- C. Paved Areas: Perform at least one field density test of subgrade for every 2,000 sq. ft. of paved area of slab, but in no case fewer than three tests. In each compacted fill layer, perform one field density test for every 2,000 sq.ft. of overlaying building slab or paved area, but in no case fewer than three tests.
- D. Asphalt Paving: Test in-place asphalt concrete courses for compliance with requirements for thickness and surface smoothness.
- E. Thickness: In-place compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:
- | | |
|-----------------|---------------------|
| Base Course: | 1/2", plus or minus |
| Surface Course: | 1/4", plus or minus |
- F. Surface Smoothness: Test finished surface of each asphalt concrete course for smoothness, using 10' straightedge applied parallel with, and at right angles to centerline of paved area. Surface will not be acceptable if exceeding the following tolerances for smoothness:
- | | |
|-------------------------|-------|
| Base Course Surface: | 1/4" |
| Wearing Course Surface: | 3/16" |
- Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template; 1/4".
Check surface areas at intervals as directed by Architect.
- G. Portland Cement Concrete (Paving & Structural): Sampling and testing for quality control during placement of concrete may include the following, as directed by Architect.
- H. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with

ASTM C 94.

1. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
2. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM D 231 pressure method for normal weight concrete; one for each day's pour of each type of air-entranced concrete.
3. Compression Test Specimen: ASTM C 31; one set of 3 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
4. Compressive Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yds. plus additional sets for each 50 cu. yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, one specimen tested at 28 days, and one specimen retained in reserve for later testing if required. When total quantity of a given class of concrete is less than 50 cu. yds, strength test may be waived by Architect, if, in his judgment, adequate evidence of satisfactory strength is provided. When strength of field-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.

END OF SECTION 01 4500

SECTION 01 5526

TRAFFIC CONTROL

This specification changes a portion of 2017 Edition APWA Standard Specification No. 01 55 26. All other provisions of the Section remain in full force and effect.

PART 1 GENERAL

1.5 TRAFFIC CONTROL TECHNICIAN

Add the following paragraph:

- B. Responsibilities and Duties:
 - 1. Oversees all traffic control operations.
 - 2. Implements the Traffic Control Plan.
 - 3. Remains available 24 hours a day, seven days a week and can be on-site within 30 minutes of notification.
 - 4. Corrects deficiencies immediately upon verbal or written notification from the Engineer or representative.
 - 5. Inspect and document inspections of traffic control on a form acceptable to the Engineer at least four times each day, at least one of which must be conducted during nighttime hours.
 - a. Before beginning of shift.
 - b. At mid-shift.
 - c. Half-hour after shift ends.
 - d. At the midpoint of the off-shift period.
 - 6. Coordinates project traffic control with emergency services and local law enforcement agencies.
 - 7. Inspect and document inspections of traffic control twice each day when no construction work is being done.
 - a. One during day light hours and one during night time hours.
 - b. Conduct inspections a minimum of 8 hours apart.
 - 8. Completes a daily record of traffic control activities using a form acceptable to the Engineer.
 - 9. Submit to the Engineer inspection and activities forms each week on a day and time acceptable to the Engineer.

1.6 FLAGGER

Modify the following:

- B. Equipment:
 - 1. In compliance with most current version of MUTCD.

- C. Clothing:
 - 1. In compliance with most current version of MUTCD.

1.7 SAFETY

Add the following article:

- A. When exposed to public vehicular traffic, employees shall wear hard hats and warning vests or other suitable garments marked with or made of reflectorized or high-visibility material in compliance with most current version of MUTCD.

PART 3 EXECUTION

3.2 TRAFFIC CONTROL DEVICES

Add the following paragraphs:

- D. Wash devices weekly unless conditions warrant more frequent cleaning.
- E. Replace any device missing any part of the message or background.
- F. Replace or repair graffiti damaged signs.

Add the following article:

3.3 SPECIAL TRAFFIC CONTROL PROVISIONS

- A. In General:
 - 1. Provide, maintain and control all traffic information signs and traffic control devices as indicated in the most current version of the MUTCD.
 - 2. Properly secure all temporary traffic control signs and barricades from movement in high winds.
 - 3. Provide and maintain one 12 foot wide minimum traffic lane at all times.
 - 4. Limit work in residential areas from 7:00 a.m. to 9:00 p.m.
- B. Pedestrian Traffic Control:
 - 1. Regulate pedestrian traffic as shown in the most current version of the MUTCD. Provide safe, convenient travel path that replicates as nearly as possible the most desirable characteristics of sidewalks or footpaths.
 - 2. At the work zone, use solid rails or firm plastic netting between barricade devices. They must be easily identifiable to the vision impaired and the blind using a white cane.
 - 3. Make passageways safe within and around the work zone. Help the blind, the wheel chair bound and people with other types of navigational disability.
 - 4. Do not lead pedestrian into direct conflict with work site vehicles, equipment, or with mainline traffic moving through or around the work site.

5. Meet ADA (Americans with Disabilities Act) requirements when constructing temporary ramps over curb, gutter, sidewalk, and other construction.
 6. Close sidewalk to public use only when approved by the City's transportation ENGINEER.
 7. Coordinate with school flagging personnel.
- C. Vehicular Traffic Control Plan:
1. Submit a Traffic Control Plan that satisfies requirements of the current version of the MUTCD. All signalized intersections shall be treated as a separate construction phase.
 2. Show phases of street improvement work. Provide the least amount of traffic disruption.
 3. Provide signs that display name of businesses located in the work zone. Show motorist by signage, how to reach business destination.
- D. Work Site Traffic Supervisor Responsibilities: Follow the "Elements of a good Traffic Control Program" of the most current version of the MUTCD.
- E. Access to Properties:
1. Provide access to all affected properties except for durations less than 24 hours or during periods when achieving concrete strengths.
 2. Notify occupants of adjacent properties at least 48 hours in advance of change or loss of access and the anticipated duration.
 3. Construct temporary ramps over curb, gutter, sidewalks and other construction to each residence and business entrance as required for uninterrupted vehicular and pedestrian access.
- F. Parking Restrictions:
1. Post "No Parking" signs every 50 feet 24 hours in advance of need.
- G. Public Transit:
1. Keep existing bus stops open and clear for bus service operation.
 2. Minimize bus service disruption in and around the stops.
 3. Provide at least 48 hours advance notice to the Utah Transit Authority.
 4. Notify Utah Transit Authority of Road Closures
- H. Signalized Intersections, Major Streets, State Roads, Downtown Area:
1. Operate large equipment on major streets, state roads and signalized intersections only during off-peak traffic hours. Peak traffic hours are 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.
 2. For each approach to a major street provide a Certified Flagger. Flagger shall only control traffic outside the limits of a signalized intersection.
 3. Existing left turn lanes may be used for through traffic movement when the need to reduce the through traffic to one lane approach to signalized intersections. Install "No Left Turn" signs stating the "Bus Exception" message.
- I. Partial or Complete Lane Closure Authorization (Without Permit):
1. Provide Certified Flagger when work momentarily affects travel lanes. Example: A backhoe maneuvering in a travel lane outside of the construction work zone.

2. If one traffic lane for each direction cannot be maintained, provide one 12 ft. wide lane with Certified Flaggers alternating traffic flow for each direction.
 3. Major streets may be reduced to one 12 ft. wide travel lane for each direction during work hours. Left turn prohibition shall be required when through lanes are reduced to one lane of travel. Install “No Left Turn” signs stating the “Bus Exception” message.
- J. Street Closure: (Permit Required)
1. Maintain local traffic at all times during the project.
 - a. Maintain access to abutting properties at all times via one 12 ft. wide travel lane.
 - b. Provide alternative access whenever normal access is blocked and an alternative access method is possible.
 - c. Notify affected property owners 48 hours in advance of change or loss of access and the anticipated duration of time.

END OF SECTION 01 5526

SECTION 01 5719

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 GENERAL PROVISIONS

- A. Comply with all Federal, State, local laws and regulations, and the provisions of this Section controlling environmental pollution.
- B. Prevent pollution of streams, lakes, ponds, and reservoirs with sediment, fuels, oils, bitumens, chemicals, or other harmful materials and pollution of the atmosphere from particulate and gaseous matter.
- C. Incorporate Best Management Practices to prevent hazardous material releases by segregating wastes, providing secondary containment and having spill kits and absorbents on hand.

1.2 HAZARDOUS MATERIAL - DISCOVERED DURING CONSTRUCTION

- A. Immediately suspend work in the area and notify the ENGINEER if abnormal conditions are encountered or exposed during construction that indicates the presence of a hazardous material, toxic or hazardous waste.
 - 1. Treat the conditions with extreme caution.
 - 2. Abnormal conditions include, but are not be limited to, the following: presence of barrels; buried storage tanks; above ground tanks; obnoxious odors; excessively hot earth; stained and discolored soils; smoke; unidentifiable powders, sludges, pellets; or any other condition that could be a possible indicator of hazardous material, toxic or hazardous waste.
- B. Resume operation in this area when directed by the ENGINEER. Continue working in other areas of the project, unless otherwise directed by the ENGINEER.
- C. Dispose of the hazardous material, toxic or hazardous waste under the requirements and regulations of the Utah State DEPARTMENT of Environmental Quality and United State Environmental Protection Agency.
 - 1. Perform by change order necessary work required to dispose of these materials.
 - 2. Disposition of waste materials requiring special procedures by certified personnel will be arranged by the ENGINEER with qualified persons to dispose of the material.

1.3 HAZARDOUS MATERIAL - CONTRACTOR CAUSED

- A. Notify the ENGINEER of Environmental Quality of spills of petroleum based products or hazardous waste if the release would meet the definition of a hazardous waste as defined in 40 U.S. Code of Federal Regulations 261.
 - 1. Notify the ENGINEER immediately after the discovery of the spill.
 - 2. Notify the DEPARTMENT of Environmental Quality (DEQ) in writing within 5 calendar days of the discovery.
 - 3. Notify the DEQ in accordance with R315.9 of Utah Administrative Code. 24-hour phone number: (801) 536-4123.
- B. Dispose of spilled material according to the requirements and regulations of the Utah State DEPARTMENT of Environmental Quality.
- C. Pay for the required clean-up operations.

1.4 LIVE STREAMS

- A. Ford or work in live streams, canals or any live body of water (live water) only with approval from the Utah Division of Water Quality and Utah Division of Water Rights. Do not operate mechanized equipment in live water unless provided for in the Contract. Minimize stream, and canal siltation.
- B. Use a dike or barrier to separate work areas or pits located in or adjacent to streams from the main stream. Prevent sediment from entering adjacent streams.
- C. Treat water used to wash aggregate or water from other operations that produce sediment by filtration, settling basins, or other methods that reduce sediment concentrations to the level of the stream or lake into which it is discharged.

1.5 OPEN BURNING

- A. Not permitted.

1.6 ABRASIVE BLASTING - VISIBLE EMISSION STANDARDS

- A. Visible Emission Standards:
 - 1. Abrasive blasting inside Salt Lake or Utah Counties where the performance standards in this article, paragraph C are used: Do not discharge into the atmosphere an opacity darker than 20 percent for a period or periods aggregating more than 3 minutes in any 1 hour.
 - 2. Abrasive blasting inside Salt Lake or Utah Counties where the performance standards in this article, paragraph C are not used: Do not discharge into the atmosphere an opacity darker than 40 percent for a period or periods aggregating more than 3 minutes in any 1 hour.
- B. Visible Emission Evaluation Techniques:

1. Rad emissions from unconfined blasting at the densest point of the emission after a major portion of the spent abrasive has fallen out. Densest point will be between 6 feet and 25 feet from the impact surface of the abrasive blasting nozzle.
 2. Judge emissions from unconfined blasting employing multiple nozzles as a single source unless each nozzle meets the emission and performance standards.
 3. Read emissions from confined blasting at the densest point after the air contaminant leaves the enclosure.
- C. Performance Standards: Any one of the following may be used as a performance standard.
1. Confined blasting
 2. Wet abrasive blasting
 3. Hydroblasting
 4. Unconfined blasting using abrasives defined below:
 - a. Before blasting, the abrasive will not contain more than 1 percent by weight material passing a #70 U.S. standard sieve.
 - b. After blasting, the abrasive will not contain more than 1.8 percent by weight material 5 micron or smaller.
 - c. Abrasives reused for dry unconfined blasting are exempt from the requirements of “after blasting,” but must conform with the requirements of “before blasting” above.
- D. Abrasive Certification: Sources using the performance standard for unconfined blasting must demonstrate they have obtained abrasives from persons who have certified (submitted test results) to the Utah Air Quality Executive Secretary at least annually that such abrasives meet the requirements outlined above for abrasives.

1.7 NOISE AND VIBRATION CONTROL

- A. Identify haul routes and percussive noise sources that annoy sensitive receptors and prevent these sources from becoming a problem.
- B. Definitions and Standards - Use terminology that meets applicable American National Standards Institute (ANSI) publications and commonly accepted practices of acoustical measurements.
1. Receptor - An occupied residential dwelling, church, hospital, school, outdoor stage, or structure confining other noise sensitive activities.
 2. Noise Sensitive Zone - The land enclosed within a 1500 foot radius circle of any receptor.
 3. Sound Level - The total sound pressure level from all concurrent construction activities related to the subject project, as measured with a sound level meter using the A-weighting network (ANSI S1.4). The standard notation is dB(A) or dBA.
 4. Percussive Noise - Short burst(s) of banging or clattering noise including but not limited to blasting, pile driving, and jack-hammering.
- C. Prohibitions - Suspend construction work under the following conditions:

1. Construction activity in a noise sensitive zone causes the sound level within 10 feet of the nearest receptor to exceed: 95 dBA in daytime (7 a.m. - 9 p.m.), or 55 dBA in nighttime (9 p.m. - 7 a.m.)
 2. A noise sensitive zone on Sundays and State Holidays.
 3. Project related construction noise or vibration does not meet specifications. Suspend the portion of construction work responsible for the problem until noise is reduced to the required noise standards.
- D. Compliance:
1. Follow the local noise ordinances, except where a variance in accordance with local regulations has been granted.
 2. Local noise ordinance variance does not provide an exemption from complying with the requirements of this article, paragraph C.
- E. Percussive Noise: Notify the ENGINEER at least 2 weeks in advance of any percussive noise activity that is expected to exceed the provisions of this article, paragraph C. Coordinate with the ENGINEER to notify the public.

1.8 ENVIRONMENTAL CLEARANCE BY THE CONTRACTOR

- A. Obtain and provide the following environmental clearances before beginning project activity when adding or selecting any ground- or resource-disturbing features such as material (gravel, borrow or waste) sites, equipment staging sites, office sites, water lines, holding ponds, etc., not provided in the Contract:
1. Wetlands: Obtain written clearance from the U.S. Army Corps of ENGINEERS.
 2. Floodplains - Initiate consultation concerning the proposed additional feature(s) with the Region Hydraulics Section. Subsequent coordination with the Federal Emergency Management Agency (FEMA) may be required. Verification of non-interference by the CONTRACTOR with a floodplain or compliance with FEMA guidelines will be provided to the CONTRACTOR by the Region Hydraulic ENGINEER.
 3. Prime, Unique, and Important Farmland - Initiate consultation concerning the proposed additional feature(s) with the farmland specialist with the Regions Environmental ENGINEER. Subsequent coordination by the CONTRACTOR with the U.S. Natural Resources conservation service may be required. The Region provides written clearance to the CONTRACTOR.
 4. Utah Pollutant Discharge Elimination System (UPDES) - Obtain UPDES permit for storm water discharge from Utah Division of Water Quality (DWQ). Comply with the requirements of the permit including submittal of Notice of Intent (NOI) form to DWQ and development and approval of the storm water pollution prevention plan by the DWQ when required.
 5. Air Quality: Obtain construction approval from the Utah Division of Air Quality and West Valley City if construction project or area of disturbance outside of the project is in an area of air quality non-attainment for any pollutant.
- B. CONTRACTOR is responsible for all costs of pursuing and obtaining all the above clearances, and is not entitled to time extension for delays encountered in obtaining these clearances.

PART 2 PRODUCTS Not used.

PART 3 EXECUTION Not used.

END OF SECTION 01 5719

SECTION 01 5720

ENVIRONMENTAL CONTROL SUPERVISOR

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Description of the responsibilities of the CONTRACTOR'S Environmental Control Supervisor (ECS) to monitor and document environmental mitigation and compliance on the project.

1.2 RELATED SECTIONS

- A. Section 01 57 19: Environmental Protection
- B. Section 01 57 00: Temporary Controls
- C. Section 32 93 13: Mulch
- D. Section 32 92 00: Seed, Turf Seed, and Sod

1.3 SUBMITTALS

- A. Submit a NOI and a NOT to the Division of Water Quality at the Department of Environmental Quality (DEQ) as described under Article 3.3.
- B. Submit Storm Water Pollution Prevention Plan (SWPPP) inspection reports to the ENGINEER within 24 hours of the inspection as set forth under Article 3.4.
- C. Obtain and submit a West Valley City Stormwater Permit.

1.4 ECS QUALIFICATIONS

- A. Knowledge of erosion control principles and best management practices for roadway construction sites.
- B. Knowledge of the laws surrounding environmental clearances and how to obtain these clearances required under Section 01 57 19, article 1.8 AEnvironmental Clearances by the CONTRACTOR.@
- C. Be sufficiently knowledgeable to understand the significance and implementation of environmental plans, details, and specifications.

1.5 NON-PERFORMANCE PENALTY

- A. A \$500 non-performance penalty assessed against the CONTRACTOR for each calendar day, or portion thereof, during which the project is in non-compliance with permits and regulations.
- B. No extension of contract time allowed for any project delay resulting directly or indirectly from a violation of project environmental requirements.

PART 2 PRODUCTS Not used.

PART 3 EXECUTION

3.1 GENERAL RESPONSIBILITIES

- A. Successful implementation of all environmental protection commitments and the correct installation of environmental mitigation measures associated with the project.
- B. Keep the project in environmental compliance.
- C. ECS responsibilities take precedence over any other work commitments.
- D. Obtain environmental clearances as addressed in Section 01 57 19, article 1.8
AEnvironmental Clearances by the CONTRACTOR@ for disturbances, waste sites, staging areas, for example not provided in the Contact.
- E. Be available at all times (24-hours a day) during the active project construction to respond as necessary to environmental compliance and to the direction of the ENGINEER. Be available as needed during seasonal shutdowns.

3.2 REGULATORY AGENCY COORDINATION

- A. Work through the ENGINEER to maintain coordination and communications between the CONTRACTOR and Regulatory Agencies. Process all official communications through the ENGINEER.
- B. Coordinate and conduct on-site meetings on an as-needed basis with Regulatory Agency Inspectors. This could include Regulatory Inspectors from the Utah Division of Water Quality, Utah Division of Water Rights (Stream Alterations), U.S. Army Corps of Engineers (wetlands), and U.S. Fish and Wildlife Service.
- C. Notify the ENGINEER in writing of the results of any agency coordination meeting within 24-hours.

3.3 UTAH POLLUTION DISCHARGE ELIMINATION SYSTEM (UPDES) PERMIT COMPLIANCE

- A. Prepare, sign, and submit to the ENGINEER a Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity under the UPDES General Permit No. UTS 000001. NOI forms can be obtained from the DEQ or UDOT.
- B. Do not start earth-disturbing activities until the completed and signed NOI form has been submitted to the Division of Water Quality at the DEQ.
- C. Work directly with the DEPARTMENT SWPPP coordinator designated by the ENGINEER.
- D. Place temporary or permanent stabilization measures (for example, mulch, erosion control blankets) as soon as practicable but in no case longer than 14 days unless construction activities resume on that portion of the site within 21 days when activity ceased. If snow cover precludes the mulch placement, apply as soon as practicable. Seasonal shutdowns require that mulch be placed for all disturbed portions of the project.
- E. Do not start earth disturbing work until project perimeter temporary erosion measures and those protecting environmentally sensitive areas are in place and approved.
- F. Understand that the erosion control measures on the SWPPP are diagrammatic and must be adapted in the field to meet their intended purpose. As the project progresses through the various construction phases, implement the appropriate erosion control measures for that stage. Make necessary changes to the SWPPP to accommodate construction sequencing.
- G. Obtain approval from the ENGINEER to make changes to the SWPPP. Install additional erosion control measures as directed by the ENGINEER.
- H. Be available as needed to coordinate the SWPPP, make necessary changes, inspect, maintain sediment control devices, and resolve other sediment and erosion control issues.
- I. Monitor earthwork during construction to detect any evidence of the start of erosion. Pro-actively apply corrective measures.
- J. Apply the appropriate maintenance of temporary erosion controls. Refer to Section 10 57 00.
- K. At the end of construction, submit a Notice of Termination (NOT) form to the Division of Water Quality to terminate the permit. NOT forms can be obtained at the DEQ or UDOT.

3.4 SWPPP INSPECTIONS

- A. At the commencement of earth moving activity, start performing inspections of all temporary erosion control measures a minimum of once every seven calendar days and

within 24 hours after any storm event greater than 0.5 inch. Where construction sites have been temporarily or seasonally shut down, conduct inspections once a month.

- B. Invite OWNER'S SWPPP coordinator appointed by the ENGINEER to the inspections.
- C. After each inspection, complete an inspection report and submit it to the ENGINEER within 24 hours. Include the following information:
 - 1. Name(s) of personnel attending the inspection.
 - 2. Date of inspection
 - 3. List of problems identified in the previous inspection and document if corrections have been made.
 - 4. List by station, earth disturbing activities since previous inspection.
 - 5. List by station, erosion and sediment control measures installed since previous inspection.
 - 6. List by station, new and unresolved problems encountered with specific erosion control measures and describe solutions to be implemented.

3.5 UNIT PRICE – MEASUREMENT AND PAYMENT

- A. Environmental control supervisor shall be incidental and included in cost of all other work.

END OF SECTION 01574

SECTION 01 7113

MOBILIZATION AND DEMOBILIZATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Mobilization and demobilization requirements

1.2 DEFINITIONS

- A. Mobilization includes bringing all necessary equipment to the site to do the Work. It also includes all labor, materials, and equipment to set up temporary offices, buildings, facilities, signs and utilities.
- B. Demobilization includes removing all construction equipment and debris, so site is left clean.

1.3 TEMPORARY FACILITIES

- A. Field Office: CONTRACTOR'S choice.
- B. Utilities: Provide power, telephone, water, storm and sanitary facilities, and all other temporary utilities required.
- C. Security and Protection: Construct and maintain temporary fencing for the protection of materials, tools, and equipment. Obtain prior approval for all fence locations.
- D. Construction and Support: Set up and maintain in a neat and orderly manner temporary roads and paving, dewatering facilities, enclosures, identification signs and bulletin boards, waste disposal and temporary heat. Provide and maintain temporary all weather pedestrian walk ways and road detours.
- E. Invert Cover: Install covers as shown in Standard Plans or Drawings. Installation must be tight so no debris can by-pass the cover and enter the pipes below.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Temporary Materials: CONTRACTOR'S choice.

PART 3 EXECUTION

3.1 INSTALLATIONS

- A. Relocate and modify temporary facilities as required.
- B. Install temporary utility service or connect to existing service.
- C. Locate field offices, storage sheds, sanitary facilities, and other temporary Construction and support facilities for easy access. Use of gasoline-burning, open flame, or salamander type heating units is prohibited.

3.2 REMOVALS

- A. Completely remove temporary materials and equipment;
 - 1. When construction needs can be met because of permanent installation.
 - 2. At completion of the work.
- B. Clean or repair damage caused by installation or use of temporary facilities.
- C. Restore areas to original or to specified condition at completion of the Work.

END OF SECTION 01 7113

SECTION 01 7123
CONSTRUCTION LAYOUT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Construction surveying requirements

1.2 SUBMITTALS

- A. Prior to contract closeout, submit:
 - 1. Documentation to verify accuracy of survey work.
 - 2. When required by Laws and Regulations, submit a certificate, signed by a licensed professional, certifying that elevations and locations of improvements conform with the Contract Documents.
 - 3. All survey data, survey information showing dimensions, location angles, and elevations of construction on contract Record Documents.

1.3 SURVEY REFERENCE POINTS

- A. Known basic horizontal and vertical control points for the Project are indicated.
- B. Locate and protect survey control points prior to starting site work, and preserve all permanent reference points during construction.
- C. Notify ENGINEER in writing within 24 hours of any survey work changes, or clarifications required for Project. Secure written authorization prior to making any changes or relocations.
- D. Report in writing when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- E. Replace construction stakes damaged or destroyed by CONTRACTOR at no additional cost to OWNER.

PART 2 PRODUCTS – Not Used

PART 3 EXECUTION

3.1 PROJECT SURVEY REQUIREMENTS

- A. Any work done without line and grade established by CONTRACTOR is at CONTRACTOR'S own risk.
- B. Locate and layout by instrumentation and similar appropriate means to include but not limited to:
 - 1. Pavement Subgrade and Finish Grade
 - 2. Site improvements
 - i. Stakes for grading, fill and topsoil placement
 - ii. Slope elevations
 - iii. Utility locations and invert elevations
 - 3. Batter boards for structures
 - 4. Retaining wall locations and elevations

5. Curb and gutter alignment and grade
6. Building foundations, column locations and floor levels
7. Controlling lines and levels required for civil, mechanical, and electrical trades

END OF SECTION 01 7123

**SECTION 03 3000
CAST-IN-PLACE CONCRETE**

PART 1 - GENERAL

1.1 SUMMARY

- A. The work to be performed under this section shall consist of furnishing all labor, materials, and equipment to form, pour, finish, and cure concrete walks, curbs and gutters, flat work, retaining walls, footings, mowstrips, and other concrete as per the plans and specifications. The work may include but not be limited to excavation, forming, pouring, finishing, jointing, curing, protecting, removing forms, restoring earth or sod around the edges, and guaranteeing the work.

PART 2 - MATERIALS

2.1 CEMENT

- A. The cement shall be Portland Type II cement meeting current AASHTO Designation M-85 Specifications. The supplier and mix of concrete shall not be changed during the complete concrete phase of the project. All concrete shall be Class AA (AE) Type II. A 6.5 bag cement mix shall be used with a slump of 4-inch maximum. The concrete shall have a 6% air entrainment with a plus or minus variable of 1%. All air entraining agents shall conform to the requirements of AASHTO Designation ASTM260. The 28 day compressive strength shall be 4,000 P.S.I.

2.2 AGGREGATE

- A. The aggregate shall be well graded from fine to coarse. The fine aggregate shall be uniformly graded meeting the requirements of AASHTO Designation ASTM-C33. Coarse aggregate shall be 1" to #4 conforming to the requirements of AASHTO Designation M-92.

2.3 FIBER REINFORCEMENT

- A. Synthetic fibrous reinforcement: Collated, fibrillated with a mix ratio of 1/5 pounds of fiber to 1.0 cubic yards of concrete.

2.4 WATER

- A. The maximum water/cement ratio shall be 5 gallons per sack. All water used in mixing the concrete shall be clean and free of oil, alkali, organic matter, or other deleterious substances.

2.5 FILL AND BACK FILL

- A. The entire area beneath the concrete shall be excavated to the proper depth to allow for the specified thickness of untreated base course or the area shall be compacted to 95% as measured by a Procter test.
- B. All excavated material shall be either re-used on the site or hauled away as specified on the plans.
- C. Where untreated base course (free drainage material) is specified, the contractor shall import the required quantities from a local supplier. The contractor shall submit samples of the material to be used to the Inspector 3 days prior to use on the site. The untreated base course shall meet the requirements of Section 301 of the most recent edition of State of Utah Standard Specifications for Road and Bridge Construction. This refers to AASHTO Designations I-90, T-27, T-11, T-19 for mineral aggregate requirements. The gradation shall be for 3/4 or 1" maximum passing through the sieves in the percentages and with the

tolerances shown on page 108, section 301.03 of the State Standard Specifications referred to above. (Base material shall be installed 4" wider than concrete walk width, both sides.)

2.6 FORMS

- A. Forms shall be of suitable materials such as wood, plastic, metal, or combinations thereof. Forms shall be of the shape and dimensions shown on the plans and true to line and grades specified. All forms shall be free from knotholes, loose knots, cracks, splints, warps, or other defects affecting the strength or appearance of the finished product. All forms shall be free of bulges and warping. They shall be cleaned thoroughly before they are used on this project. There shall be no split holes, bolts, or nuts on the final concrete surface when the forms are removed.
- B. If at any stage of work, during or after placing the concrete, the forms sag or bulge the affected concrete shall be removed. Exceptions may be taken by the Inspector if the concrete is going to be covered with earth.

PART 3 - EXECUTION

3.2 JOB SITE CLEANLINESS

- A. All debris shall be removed from the inside of the forms prior to placement of any concrete. Placement operations may be postponed when in the opinion of the Inspector rainfall, excessive wind, low temperatures, wet spots, or the base is not sufficiently compacted. The Contractor shall take all necessary measures to protect the concrete after placement to prevent rain, graffiti, or other damage to the surface.
- B. Concrete mix trucks shall be routed to each pour over areas where the least possible damage will occur to the existing sprinkler irrigation system, utilities, lawn, or plant materials. The Contractor shall be responsible for repair of damage done by the concrete mix trucks and any other vehicles involved in these operations.
- C. The concrete shall be spread in horizontal layers insofar as practical & only of the thickness that can be satisfactorily hand worked or compacted with vibrators & other such equipment.
- D. The concrete shall be deposited as near the final resting place as possible so as to minimize working it and to prevent separating the ingredients.
- E. The concrete slope shall be 1" per 10' or 1% in the direction of the natural grade or as indicated on the plans. Flat work will have not more than a 1/8" difference in a 20' radius.

3.3 SAMPLING AND TESTING

(Testing as noted in this section is at the owner's option, and generally will not be required unless verification of the contractor's workmanship and quality is required.)

- A. All concrete shall be sampled and tested in accordance with AASHTO Designation T-141 for air entrainment, slump, and strength. The Contractor shall have the test made at the appropriate times and places. All test results shall be sent to the Owner by the testing laboratory at the Owner's expense.
 - 1. Slump Test: Slump tests shall be made in accordance with AASHTO Designation T-119. If a slump test does not meet the specifications, a second slump test shall be made immediately on the same load. The load will be accepted or rejected from the site by the inspector depending on the results of the second test.
 - 2. Air Entrainment: Air entrainment tests shall be made in accordance with AASHTO Designations T-152. If an air entrainment test does not meet the specification, a second test shall be taken immediately on the same load. The load will be accepted or rejected from the site by the Inspector depending on the results of the second test.

3. Compression Tests: Making, curing, and determining compressive strength of concrete cylinders shall be in accordance with AASHTO Designation T-22 and T23. Compressive strength shall be determined from "Strength Tests" in which the average of three standard cylinders shall constitute one strength test. Cylinders for strength tests shall be taken by the testing laboratory, which will also inspect the batching procedure to ascertain compliance with the mix design.

If any individual strength test is below 4,000 PSI, the concrete may be accepted by the project Owner after reviewing the circumstances. The price the Owner shall pay for the concrete will be reduced in accordance with the following schedule:

PSI Below Specified <u>Strength Specification</u>	Pay Factor <u>(Percent)</u>
1-100	98
101-200	94
200-300	88
301-400	80

4. Proctor Tests: Compaction of the natural or imported base shall be tested in accordance with AASHTO Designation T-191. All testing procedures and any additional tests which may be required shall follow those specified in the most recent edition of State of Utah Standard Specifications for Road and Bridge Construction.
- B. Initial sampling and testing costs to be paid by the Owner. If required, re-sampling and retesting due to failed test results to be paid by the Contractor.
 - C. All batching and mixing procedures shall be followed based upon the West Valley City Public Works Specifications as related to the most recent edition of the State of Utah Standard Specifications for Road and Bridge Construction

3.4 PREPARATION

- A. The following must be completed before concrete arrives on-site:
 1. Base course fully compacted
 2. Concrete forms in place and approved by the owner

3.5 FINISH

- A. Unless specified on the plans, the finish for all concrete flat work shall be a non-skid surface by medium brooming.

3.6 JOINTING

- A. Joints shall be placed in the concrete by the Contractor so as to control and minimize cracking. Normally the Contractor shall follow the jointing patterns shown on the plans or submit a drawing showing recommended changes for approval by the Owner.
 1. Control Joints: Shall be every 10 feet in curb and gutter. Sidewalk joints shall be in linear feet equal to the width of the walk (for example, a 6-foot wide walk shall be scored every 6 linear feet.) Slab work shall be jointed a maximum in feet of 2 -1/2 times the thickness of the concrete in inches (for example, the joints would be less than 15 feet apart for a slab 6 inches thick) and never more than 15 feet apart - for a 4" slab, between 8 - 10 feet.

The control joints shall be a depth of 1/4 the thickness of the slab. Control joints shall be made before shrinkage cracking occurs. All control joints shall be continuous across the concrete except where interrupted by a post, wall, joint, or

other obstacle.

Control joints shall be tool cut (within 24 hours of pour), filled with an exterior weather sealant, & then a one part polyurethane sealant such as Chem-Calks 900. They may be hand formed with a deep cut wand tool with 1/4 radius round edges.

2. Construction Joints: Shall be created longitudinally by the edges of paving or transversely at the end of each days work. A key way shall be formed by fastening a key of wood, plastic, or PVC to the form of the first slab. The thickness of the key way shall be 1/5 of the thickness of the slab. The edges shall be rounded 1/4" radius, never on slabs less than 6" thick. Use a release agent on wood formed key ways and 50' or less on walkways.
3. Isolation Joints: Shall be created at junctions of new and existing pavement, at buildings, or other abutting objects. A 1/2" expansion joint material (full depth) shall be placed against the existing object to prevent bonding.

3.7 WINTER CONCRETE

- A. When outside temperatures reach 35 degrees Fahrenheit, a 7-1/2 bag mix shall be used; heated water shall be used in the concrete mix. Heaters shall be used to heat the aggregate to a temperature of 70-150 degrees Fahrenheit. The aggregates shall be uniformly heated and the development of "hot spots" shall be avoided. The temperature of the mixed concrete shall be 60-90 degrees Fahrenheit. A straw blanket shall be used on all surfaces. Concrete shall not be poured on frozen ground and shall meet A.C.I. 305 and 306 requirements for hot and cold weather precautions. Concrete temperature must be maintained at 50 degrees Fahrenheit or greater but never more than 90 degrees Fahrenheit for 7 days.
- B. Any additional costs associated with using winter concrete mixes and installation/curing methods shall be borne by the contractor.

3.8 CARE AND CURING

- A. All concrete shall be cured for a minimum of 7 days before heavy loads may be placed upon it. Care shall be taken by the supplier and the contractor to prevent too rapid curing and the improper aging of the concrete. Materials such as burlap mats, hay, straw, polyethylene, and water shall be used if necessary.
- B. After pouring and during the curing process, the contractor shall see that no initials or other unnecessary marks are made into the surface. The Contractor shall replace any section containing permanent marks at the completion of the project. Prior to that time, the Contractor may grind the surface or take measures to erase any permanent marks in a section if approved by the Owner.

3.9 FORM REMOVAL

- A. After the concrete is cured, all forms, stakes, and fastening materials shall be removed from the concrete. Care shall be taken to protect the edges from chipping and to prevent damage to the concrete during removal.
- B. All forming materials shall be taken from the site as soon as possible after removal. The area taken up by the forms shall be filled with approved backfill, if needed, and compacted so that top soil shall be placed on top to meet finished grade. If the area is in existing lawn, the sod shall be removed back from the edges of the concrete the standard width of new commercial sod. Then new commercial sod shall be laid full width along the edges of the new concrete until all areas are repaired. The finish grade against the concrete shall be 1 to 1-1/2" below the top of the concrete for sod, 1" for seed.

3.10 CLEAN-UP

- A. Upon completion of the concrete work, the entire affected area shall be cleaned up by the Contractor. All wood, forms, stakes, rocks, sod, and other extraneous material shall be removed from the premises.

3.11 GUARANTEE AND REPLACEMENT

- A. The Contractor shall guarantee all concrete materials, labor, and workmanship for 1 year following final completion. Cracks in the concrete shall be routed out and filled with exterior weather sealant.

END OF SECTION

**SECTION 12 9300
SITE FURNISHINGS**

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 site furnishings:
 - 1. Play Equipment
 - 2. Table – Type 1
 - 3. Table – Type 2
 - 4. Table - Concrete
 - 5. Bench
 - 6. Bag Toss Equipment
 - 7. Playground Synthetic Surfacing

1.3 OWNER-PROVIDED ITEMS

- A. Items listed in this section will be provided by the owner and installed by the contractor.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain all site furnishings through one source from a single manufacturer for each item.
- B. Product Delivery, Storage and Handling:
 - 1. Store products in a manner which will preclude damage. Damaged materials will be rejected. Remove all damaged material from the job site immediately, and replace at no cost to the Owner.
 - 2. Furnish suitable equipment to locate all site furnishing materials carefully and efficiently. Lift materials using lifting inserts provided by manufacturer where applicable.

PART 2 - PRODUCTS

2.1 PLAY EQUIPMENT (Owner-provided, Owner-installed)

2.2 PLAYGROUND WOOD FIBER SURFACING (Owner-provided, Owner-installed)

2.3 DRINKING FOUNTAIN (Owner-provided, Contractor-installed)

- A. Manufacturer: Murdock
 - 1. Refer to plans.

2.4 BENCH (Owner-provided, Contractor-installed)

- A. Manufacturer: DuMor
 - 1. Refer to plans.
 - 2. Mount: Surface mount with stainless steel anchors and tamper-resistant stainless steel screws.

2.5 TABLE – TYPE 1 (Owner-provided, Contractor-installed)

- A. Manufacturer: MyTcoat
 - 1. Refer to plans.
 - 2. Mount: Surface mount with embedded 'Rawl' mushroom-head vandal-resistant anchors.

2.6 PAVILION (Owner-provided, Owner-installed)

- A. Manufacturer: TBD

2.7 TABLE – CONCRETE (Owner-provided, Contractor-installed)

- A. Manufacturer: Stone Age
 - 1. Refer to plans
 - 2. Mount: Surface mount with stainless steel anchors and tamper-resistant stainless steel screws.

2.8 BAG TOSS EQUIPMENT (Owner-provided, Contractor-installed)

- A. Manufacturer: Kay Park Recreation
 - 1. Refer to plans.

2.9 OUTDOOR EXERCISE EQUIPMENT (Owner-provided, Contractor-installed)

- B. Manufacturer: Greenfields Outdoor Fitness
 - 1. Refer to plans.
 - 2. Mount: Surface mount with stainless steel anchors and tamper-resistant stainless steel screws.

2.10 COLLAPSIBLE BOLLARD (Owner-provided, Contractor-installed)

- A. Manufacturer: Traffic Guard, Inc.
 - 1. Refer to plans.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not install site furnishings prior to acceptance by Owner of area to receive such materials.

- B. Examine area and conditions for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.
- C. Verify drawing dimensions with actual field conditions.
- D. Report to the Owner all conditions which prevent proper execution of this work or that are different from those shown. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written installation instructions, unless more stringent requirements are indicated on Drawings.
- B. All metal inserts, anchor slots, anchors, anchor bolts, fastenings, and other fastening devices, for attachment of site improvement items to concrete and masonry, shall be stainless steel.
- C. Contractor shall be responsible for the correct location of site improvement items. Free-standing site improvement items shall be set plumb and horizontal regardless of the pitch of the finished surrounding grade unless otherwise shown on Drawings. Install galvanized or stainless steel shims or other hardware recommended by the manufacturer as required for this purpose.

3.3 GUARANTEE

- A. Contractor will furnish and deliver standard written manufacturer's guarantee in Owner's name covering all materials and workmanship under this section, in addition to, and not in lieu of, other liabilities which the Contractor may have by law or other provisions of the Contract Documents.
- B. Contractor shall 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.

3.4 CLEANING

- A. Keep all areas of work clean, neat and orderly at all times.
- B. Clean up and remove all debris from the work area to satisfaction of Owner prior to Final Acceptance.

END OF SECTION

**SECTION 22 1400
STORM SEWER SYSTEMS**

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Storm sewer piping
- B. Storm drainage boxes with grates and lids as required.

1.2 REFERENCES

- A. The applicable provisions of the latest editions of the References listed below shall govern the Work covered under this Section, unless there is a conflict between said References and the requirements of this Section. In the case of such conflict, the requirements of this Section shall apply.
- B. Concrete Reinforcing Steel Institute (CRSI)
- C. American Society for Testing and Materials (ASTM)
- D. American National Standards Institute (ANSI)
- E. Utah Occupational Safety and Health Division (UOSHD).
- F. American Association of State Highway and Transportation Officials (AASHTO)

1.3 SUBMITTALS

- A. Submittals shall be provided in accordance with the requirements of General Conditions of these specifications.
- B. Submit evidence of materials conformance with applicable requirements as well as these specifications.
- C. Submittals shall include the following items:
 - 1. Certification of pipe materials and drainage structures conformance with the requirements specified herein. (ASTM C76, AASHTO HS20, etc)
 - 2. Concrete mix designs and reinforcing drawings for cast-in-place structures.
 - 3. Sieve analyses and/or certifications of imported bedding and backfill materials to verify conformance with requirements specified herein.
 - 4. Shop drawings of precast structures, screen filter, pipe materials, and castings.

1.4 QUALITY ASSURANCE

- A. All products shall be inspected by Contractor, prior to installation, for damage. No damaged products will be used.
- B. All working conditions shall be in accordance with the "Utah Occupational Safety and Health Division", Safe Practices for Excavation & Trenching Operations, latest edition, or other Laws or Regulations which apply.

1.5 DELIVERY AND HANDLING

- A. Workmanship and methods employed in the handling, transportation, storage, bedding, and laying of pipe, fittings, associated structures and accessories shall conform to the appropriate manufacturers' recommendations and/or ASTM recommendations.

- B. Load and unload pipe, fittings, and accessories in such a manner as to avoid shock or damage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers providing materials or equipment as part of this specification shall have a minimum of five years' experience in the manufacture, testing, and installation of such materials and equipment.
- B. Manufacturers shall provide, upon request, verification of a consistent record of meeting or exceeding materials or performance standards as specified herein.
- C. Allowable Manufacturers - Subject to compliance with specified requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to the following:
 - 1. Storm Sewer Piping
 - a. High Density Polyethylene Pipe (HDPE)
 - 1) ADS
 - 2) Hancor
 - 3) Or approved equal
 - 2. Catch Basins (Nyoplast)
 - a. Hancor
 - b. ADS - Salt Lake City, Utah
 - c. Or approved equal

2.2 STORM SEWER PIPING

- A. Unless otherwise indicated, piping materials shall conform to the following minimum requirements.
- B. Polyethylene (PE) Pipe (12" to 36" Diameter). ADS N-12 or approved equal.
 - 1. Corrugated, smooth wall polyethylene pipe shall meet the requirements of AASHTO M294.
- C. Polyvinyl Chloride (PVC) Pipe
 - 1. Polyvinyl Chloride Pipe shall meet the requirements of ASTM D1785.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify installation or connection requirements prior to construction by potholing as necessary.
- B. Verify that Work covered under other sections of these specifications is complete to the point that Work covered under this section may properly commence without hindering or damaging Work of other trades. Do not proceed with construction until unsatisfactory conditions have been corrected.

3.2 METHODS AND PROCEDURES

- A. Install materials and equipment included in the Work in accordance with materials/equipment manufacturer's recommended methods and procedures.

- B. All working conditions shall be in accordance with the "Utah Occupational Safety and Health Division", Safe Practices for Excavation & Trenching Operations, latest edition, or other Laws or Regulations which apply.

3.3 INSTALLATION

A. General

- 1. Install storm sewer piping to the lines, grades, and elevations indicated on the drawings. Install connections at the locations indicated.

B. Bedding:

- 1. Bedding shall be prepared in accordance with Section 31 20 00 of these specifications and as indicated on the drawings.
- 2. Over-excavate as necessary and install approved material to provide firm, stable foundation for sewer piping installation. Over-excavation shall be approved by Authorized owner's representative.
- 3. Prepare bedding to insure trench bottom is free of large stones, debris, frozen, organic or other deleterious materials.
- 4. Excavate to pipe bells to insure pipe is supported properly along its entire length.

C. Pipe Laying Procedures

- 1. Dewater trench as necessary to prevent the accumulation of groundwater or other unacceptable water in trench.
- 2. Pipe laying operations shall proceed in an uphill direction with all bell facing uphill unless otherwise specifically approved by Authorized owner's representative.
- 3. Contractor shall follow pipe manufacturer's recommended practice for lowering, assembling, and installing storm sewer pipe.
- 4. During pipe installation, verify that no foreign material is inside pipe. Clean interior of each pipe joint prior to installation.
- 5. Storm sewer pipe shall be laid to uniform line and grade between manholes or drainage structures unless otherwise approved by the Authorized owner's representative.
- 6. Plug open end of installed storm sewer piping and close trench at the end of each day's work. Open trenches may not be left overnight without specific permission from the Authorized owner's representative.

D. Backfilling

- 1. Install backfill and compact in accordance with manufacturer's requirements and as indicated on the drawings. Backfill shall not be placed in lifts greater than can be properly compacted to the required density.
- 2. Backfill material shall be free of large rocks, organic or frozen material.

E. Catch Basins

- 1. Excavation, bedding and backfill for catch basin installation shall be as recommended by manufacturer and as indicated on the drawings.
- 2. Install catch basins at locations and to grades indicated on the drawings.
 - a. Set catch basin lid flush with finished surface unless otherwise noted on the drawings.

3. Prevent debris from entering installed storm sewer piping via catch basins by providing suitable barriers or covers.
4. Pipe transition into catch basin must be smooth and free of any pockets or indentations. Any such inconsistencies shall be filled with non-shrink grout to form a smooth surface.

3.4 PROTECTION

- A. Provide barricades and restrict access as appropriate to prevent damage to Work in place.
- B. Contractor shall be responsible for protection of Work in place against displacement, damage, loss or theft until Owner=s acceptance. Any Work installed and subsequently damaged, lost, or displaced shall be repaired or replaced to the Owner=s satisfaction at no additional cost.

3.5 CLEANING

- A. Thoroughly clean all pipe lengths or units of all debris immediately after laying.
- B. Thoroughly clean by flushing and remove all debris from storm sewer pipe and manholes. Inspect and clean all lines as specified herein. Storm sewerage facilities shall be thoroughly cleaned prior to turning over to the Owner.

3.6 TESTING

- A. Contractor shall provide all materials, equipment, and labor to perform testing of installed storm sewer piping, structures, and manholes as required for acceptance by Authorized owner's representative.
- B. Authorized owner's representative shall be notified no less than two full working days prior to any proposed testing.
- C. Testing of storm sewer shall consist of the following.
 1. Authorized owner's representative shall visually inspect each run of piping by lamping to verify consistent line and grade.
 2. Perform testing procedures as required by City.

END OF SECTION

SECTION 260001

ELECTRICAL GENERAL PROVISIONS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. Architectural, Structural, Mechanical and other applicable documents also apply to work of this section.

1.2 DESCRIPTION OF WORK:

- A. The contract documents indicate the extent of electrical work. Provide all labor, materials, equipment, supervision and service necessary for a complete electrical system as described in divisions 26.

1.3 RELATED SECTIONS:

- A. Other Divisions relating to electrical work apply to the work of this section. See other applicable Divisions including, but not necessarily limited to:
 - 1. Division 1 – General and Supplementary Conditions
 - 2. Division 2 – Existing Conditions
 - 3. Division 3 – Concrete
 - 4. Division 5 – Metals
 - 5. Division 6 – Wood, Plastics, and Composites
 - 6. Division 7 – Thermal and Moisture Protection
 - 7. Division 8 – Openings
 - 8. Division 9 – Finishes
 - 9. Division 21 – Fire Suppression
 - 10. Division 22 – Plumbing
 - 11. Division 23 – Heating Ventilating and Air Conditioning
 - 12. Division 27 – Communications
 - 13. Division 28 – Electronic Safety and Security

1.4 INTERPRETATIONS OF DRAWINGS AND SPECIFICATIONS:

- A. Prior to bidding the job, submit requests for clarification in writing to the Architect/Engineer prior to issuance of the final addendum.
- B. After signing the contract, provide all materials, labor, and equipment to meet the intent, purpose, and function of the contract documents.
- C. The following terms used in Division 26 documents are defined as follows:
 - 1. "Provide" - Means furnish, install, and connect, unless otherwise indicated.
 - 2. "Furnish" - Means purchase new and deliver in operating order to project site.
 - 3. "Install" - Means to physically install the items in-place.

4. "Connect" - Means make final electrical connections for a complete operating piece of equipment. This includes providing conduit, wire, terminations, etc. as applicable.
5. "Or Equivalent" - Means to provide equivalent equipment. Such equipment must be approved by the Engineer prior to bidding.

1.5 EXAMINATION OF SITE:

- A. Visit the site and verify existing field conditions prior to submitting bid.
- B. All costs arising from site conditions and/or preparation shall be included in the base bid. No additional charges will be allowed due to inadequate site inspection.

1.6 QUALITY ASSURANCE:

- A. Perform work in accordance with all governing codes, rules, and regulations including the following minimum codes (latest editions or as otherwise accepted by the Authorities Having Jurisdiction):
 1. National Electric Code (NEC)
 2. International Building Code (IBC)
 3. International Fire Code (IFC)
 4. International Mechanical Code (IMC)
 5. International Plumbing Code (IPC)
 6. American Disability Act (ADA)
 7. National Electrical Safety Code (NESC)
 8. Local Codes and Ordinances
- B. Comply with all standards where applicable for equipment and materials including the following minimum standards:
 1. Underwriter's Laboratories (UL)
 2. American Society for testing Materials (ASTM)
 3. Certified Ballast Manufacturers (CBM)
 4. Insulated Cable Engineers Association (ICEA)
 5. National Electrical Manufacturer's Institute (NEMA)
 6. American National Standards Institute (ANSI)
 7. Electrical Testing Laboratories (ETL)
 8. National Fire Protection Association (NFPA)
 9. Institute of Electrical and Electronics Engineers (IEEE)
 10. American Institute of Electrical Engineer's Electrical Power
 11. Systems and Grounding in Commercial Construction
 12. Illuminating Engineers Society (IES)
- C. Provide new electrical equipment conforming to all requirements as set forth in the above standards. Provide UL labeled equipment where such label is applicable.
- D. Comply with all state and local codes and ordinances. When conflicts occur among codes, standards, drawings, and/or specifications, the most stringent requirements shall govern.
- E. Obtain all permits, inspections, etc. required by authority having jurisdiction. Include all fees in bid. Provide a certificate of approval to the owner's representative from the inspection authority at completion of the work.
- F. Provide only first-class workmanship from competent workers, conforming to the best electrical construction practices.

- G. The contractor shall have a current state contracting license applicable to type of work to be performed under this contract.

1.7 SUBMITTALS:

- A. The contractor shall submit complete shop drawings and other required submittals. Incomplete submittals will be returned to the contractor unreviewed. No time extensions or cost increases will be allowed for delays caused by the return of incomplete submittals.
- B. Shop Drawings: After the contract is awarded, but prior to manufacture or installation of any equipment, submit eight (8) complete sets of shop drawings. Partially complete sets of shop drawings are not acceptable. Submit all shop drawings in one complete submittal package. Prior to submitting shop drawings, review and certify that they are in compliance with the contract documents; Sign all approved shop drawings. Allow a minimum of two weeks for architect/engineer to review shop drawings. Refer to architectural general provision section for additional requirements.
- C. Provide equipment catalog "cut sheets", brochures and/or drawings which clearly describe the proposed equipment. Include plans, elevations, sections, isometrics, and detailed engineering and dimensional information as applicable including equipment room layouts. Electrical room layouts are required to show all electrical equipment locations for all projects that include electrical rooms. Do not submit catalog sheets which describe several different items in addition to those items to be used, unless all relevant information is clearly identified. Bind each information set in three ring binder or binders of sufficient size or sizes to enclose all information. Organize all information by section. Provide separate tabbed covers for each section of Divisions 26, 27, and 28, indicating section number for each section requiring submittals.
- D. Include on front cover of binder or binders the name and location of the project, architect, electrical engineer, general contractor, electrical contractor, subcontractors, supplier/vendor, order number, volume, date, and any other applicable information. Certify that shop drawings are submitted in accordance with the contract documents with a written statement indicating compliance. Submittals will be reviewed and comments produced two times maximum. Additional reviews will be billed at current rates.

1.8 OPERATION AND MAINTENANCE MANUALS:

- A. Submit four (4) complete sets of operating instruction and maintenance manuals for all equipment and materials provided under Divisions 26, 27, and 28.
- B. Provide manufacturer's recommended operating and maintenance instructions, cleaning and servicing requirements, serial and model number of each piece of equipment, complete list of replacement parts, performance curves and data, wiring diagrams, warranties, and vendor's name, address, and phone numbers. Do not submit information which describes several different items in addition to those items to be used, unless all relevant information is clearly identified. Assemble all data in completely indexed volume or volumes. Engrave the job title, and name, address, and phone numbers of the contractor on the front cover and on the spine. Incomplete O&M manuals will be returned to the contractor for corrections / additions.

1.9 RECORD DRAWINGS:

- A. Maintain on a daily basis a complete set of "Red-Lined Drawings", reflecting an accurate record of all work including addendums, revisions, and changes. Indicate precise dimensioned locations of all concealed work and equipment, including concealed or embedded conduit, junction boxes, etc. Record all "Red-Lined Drawing" information on a set of full sized prints of

the contract drawings.

- B. Certify the "Red Lined Drawings" for correctness. Indicate on each drawing the name of the general and electrical contractors with signatures of each representative responsible for the work.
- C. The electrical engineering design firm will create record (as-built) drawings from the certified red-lined drawings; however, the general and electrical contractors retain the responsibility for the accuracy of the record drawings.

1.10 WARRANTY:

- A. Ensure that the electrical system installed under this contract is in proper working order and in compliance with drawings, specifications, and/or authorized changes and is free from electrical defects. Without additional charge, replace or repair, to satisfaction of the owner's representative, except from ordinary wear and tear, any part of the installation which may fail or be determined unacceptable within a period of one (1) year after final acceptance or as otherwise indicated in individual sections, but in no case less than one year. Warranty incandescent and fluorescent lamps only for a period of two months from the date of substantial completion.
- B. Provide complete warranty information for each item including beginning of warranty period, duration of warranty, names, addresses, and telephone numbers and procedures for filling a claim and obtaining warranty services. Written warranties and guarantees are to be submitted separately as:
 - 1. Originals bound in a binder clearly identified with the title, "WARRANTIES AND GUARANTEES," the project name, the project number, and the Contractor's business name.
 - 2. Electronic documents in *.pdf format.

PART 2 – PRODUCTS

2.1 GENERAL:

- A. All materials shall be new and shall bear the manufacturer's name, trade name, and the approved testing laboratory such as the UL label in every case where a standard has been established for that particular material. Used materials are acceptable only if specifically indicated on drawings.

2.2 SUBSTITUTION OF MATERIALS:

- A. Provide only specified products or products approved by addendum. Substitutions will be considered if two copies of the proposal is received at the architect's/engineer's office eight (8) working days prior to the bid day. Include in the proposal the specified and proposed catalog numbers of the equipment under consideration and a catalog cut sheet(s) with pictorial and descriptive information. Certify that the equipment proposed is equal to that specified, that it has the same electrical and physical characteristics, compatible dimensions, and meets the functional intent of the contract documents.
- B. It is the responsibility of the contractor to make all substituted equipment comply with the intent of the contract documents and bear all cost associated with conflicts arising from the use of substituted equipment.

- C. Provide samples if so required by the architect or engineer before or after bid day.

2.3 SPARE PARTS:

- A. Provide spare parts as specified in Divisions 26, 27, and 28 sections. Deliver all spare parts to owner's representative prior to substantial completion.

PART 3 – EXECUTION

3.1 GENERAL:

- A. Workmanship: Provide only first class workmanship from competent workers. Defective materials or workmanship will not be allowed on the project. Provide competent supervision for the work to be accomplished. Keep same foreman on the job, unless a change is authorized by the engineer.
- B. Coordination: Prior to construction, layout electrical work and coordinate work with other trades. Sequence, coordinate, and integrate installation of materials and equipment for efficient flow of the work. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed. Install electrical equipment to facilitate maintenance and repair or replacement of equipment components. Coordinate the installation of electrical materials and equipment above ceilings with suspension system, mechanical equipment and systems, and structural components. Coordinate with all utilities including power, communication, and data installations.
- C. Provide cutting, drilling, channeling, etc. only as necessary for proper completion of the work. Do not cut structural members unless authorization is issued in writing by the architect/engineer.
- D. Repairs: Repair damage to building, grounds, or utilities as a result of work under this contract at no additional cost to the owner.
- E. Dimensioning: Electrical drawings indicate locations for electrical equipment only in their approximate location, unless specifically dimensioned. Do not scale electrical drawings for dimensional information. Refer to architectural drawings and shop drawings where applicable for locations of all electrical equipment. Field verify all dimension on the job site.
- F. Provide block-outs, sleeves, demolition work, etc., required for installation of work specified in this division.
- G. Standards: Provide electrical installation in accordance with manufacturer's written instructions, applicable requirements of NEC, NEMA standards, and NECA's "Standards of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.
- H. All workmen doing work of any nature on State of Utah projects must at all times carry their electrician's license with them and show it upon request. The acceptable ratio of apprentice to journeyman electricians on the job is 1:1.

3.2 REQUESTS FOR INFORMATION:

- A. When it is clearly apparent that information is not adequately described in the construction documents or when a coordination problem exists, submit a request for information (RFI) through proper contractual channels. The electrical engineering design firm will provide a

response through its contractual channel. Although verbal direction may be given to expedite changes, responses are not considered part of the contract documents until a change order has been issued and signed by the Owner or his designated representative. The Contractor shall bear all costs associated with proceeding on any change order that has not been approved by the Owner or his designated representative.

- B. Any damages caused by construction delays due to frivolous RFI's, will be born solely by the Contractor.

3.3 SAFETY PRECAUTIONS:

- A. Provide all necessary guards or construction barriers and take all necessary precautions to insure the safety of life and property.

3.4 CLEAN:

- A. Clean up all equipment, conduit, fittings, wire, packing cartons, plastic, and other debris that is a direct result of the installation of the work of this division, both during the execution, and at the conclusion, of the project. Keep the site clean and safe during the progress of the work. Clean fixtures, interior and exterior of all equipment, and raceways prior to final acceptance. Vacuum interior of all electrical panels and equipment. Correct any damaged equipment. Touch-up or repaint if necessary.

3.5 TEMPORARY POWER:

- A. Make arrangements with the proper institution authority for all temporary electricity.
- B. Provide temporary power, complete with metering and wiring for lighting and power outlets for construction tools and equipment. Report the initial meter reading to the owner/institution, or otherwise as may be directed.
- C. Service shall be provided with a main disconnect and all 20 ampere receptacles protected by 20 amp GFI, single-pole breakers. No attempt is made herein to specify construction power requirements for equipment in detail. Provide all electrical equipment and wiring as required.
- D. As soon as permanent power and metering is available, the temporary power supply shall be disconnected and removed from the project site.
- E. All temporary wiring shall meet the requirements of NEC Article 590 and the State Industrial Commission.

3.6 POWER OUTAGES:

- A. All power outages required for execution of this work shall occur during non-standard working hours and at the convenience of the owner. Any electrical service interruption will be coordinated at least 7 days in advance of the power shut-off. Include all costs for overtime work in bid. Coordinate all outages and proceed only after receiving authorization from the owner's representative. Keep all outages to an absolute minimum.

3.7 STORAGE AND PROTECTION OF MATERIALS:

- A. Provide storage space for storage of materials and apparatus and assume complete responsibility for all losses due to any cause whatsoever. Lost or damaged materials will be replaced at no additional cost to owner. Do not store materials and apparatus in any public thoroughfare or in any area on the site where such storage would constitute a hazard to

persons in the vicinity. Protect completed work, work underway, and apparatus against loss or damage.

3.8 EXCAVATING FOR ELECTRICAL WORK:

- A. Verification: Prior to excavating, locate and protect existing utilities and other underground work in a manner which will ensure that no damage or service interruption will result from excavating and backfilling. Observe all State and Local codes prior to excavating. Do not disturb walls, footings, and other structural members in any way.
- B. Protection: Provide barricades, warning signs, and illumination to protect persons from injury at excavations. Provide temporary coverings and heat as necessary to protect bottoms of excavations from freezing and frost action. Do not install electrical work on frozen excavation bases or subbases.
- C. Coordination: Do not excavate for electrical work until the work is ready to proceed without delay.
- D. Excavated Materials: Temporarily store excavated materials near excavation in manner which will not interfere with or damage excavation or other work. Dispose of and remove excavated materials which are either in excess of quantity needed for backfilling or do not comply with the requirements for backfill material.
- E. Burial Depths: Burial depths must comply with NEC Section 300-5 (or State of Utah requirements, whichever is more stringent), unless noted otherwise on drawings.
- F. Excavation Permits: Obtain all shut-down and excavation permits as may be required for proper completion of the work.

3.9 BACKFILL MATERIALS:

- A. For buried conduits or cables (other than below slab-on-grade, or concrete-encased), provide 2" thickness of well-graded sand on all sides of conduits or cables.
- B. For trench backfill to within 6" of final grade, provide soil material suitable for compacting to required densities.
- C. For top 6" of excavation, provide top soil.
- D. Backfill excavations in 8" high courses of backfill material, uniformly compacted to the following densities (percent of maximum density, ASTM D 1557), using power-driven hand-operated compaction equipment:
 - 1. Lawn/Landscaped Areas: 85 percent for cohesive soils, 95 percent for cohesionless soils.
 - 2. Paved Areas, other than roadways: 90 percent for cohesive soils, 95 percent for cohesionless soils.
- E. Where subsidence is observable at electrical work excavations during project warranty period, remove surface, add backfill material, compact, and replace surface treatment. Restore surface to original condition.

3.10 LABELING:

- A. Engraved black plastic laminated, with white-core labels, 1/16" thick, shall be permanently

attached on both the interior and exterior the following electrical equipment:

1. Branch panels
2. Disconnect switches
3. Time switches
4. Similar equipment.
5. Lighting contactors and associated switches
6. Junction boxes larger than 4x4x1/2.

- B. The labels shall have 1/4" high, engraved letters, such as EF-1, AC-1, Panel A, etc.

3.11 CONCRETE BASES:

- A. Concrete bases: Refer to Section [260551 – Exterior Area Lighting](#).
- B. Transformer Pads: Provide and locate properly sized concrete pads for power company furnished pad mounted transformers in accordance with power company clearance requirements.

3.12 TESTS:

- A. Notify engineer prior to all testing specified herein at least three business days prior to testing. Engineer shall observe all tests to insure the proper operation of the electrical system.

3.13 PROJECT FINALIZATION AND START-UP:

- A. Upon completion of the work, have each factory representative and/or subcontractor assist in start-up and testing of their respective systems.
- B. Have each representative give personal instructions on operating and maintenance of their equipment to the owner's maintenance and/or operation personnel.
- C. Have representatives certify each system with a written statement indicating that they have performed start-up and final check out of their respective systems.

3.14 FINAL REVIEW:

- A. Have the project foreman accompany their reviewing parties and remove coverplates, panel covers, access panels, etc. as requested, to allow review of the entire electrical system.

END OF SECTION

SECTION 260070

ELECTRICAL CONNECTIONS FOR EQUIPMENT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.
- B. This section is a Division 26 General Provisions section, and is part of each Division 26 sections making reference to electrical connections.

1.2 DESCRIPTION OF WORK:

- A. Extent of electrical connections for equipment include all final electrical connections for all equipment having electrical requirements including, but not necessarily limited to the following:
 - 1. Equipment specified under all divisions of the contract. Refer to other divisions for specific electrical requirements.
 - 2. Owner-furnished equipment

1.3 QUALITY ASSURANCE:

- A. STANDARDS: Refer to [Section 260001 – Electrical General Provisions](#) as applicable.
- B. SHOP DRAWINGS: Not required.

PART 2 – PRODUCTS

2.1 GENERAL:

- A. Provide all materials for electrical connections including, but not necessarily limited to the following:
 - 1. Raceways
 - 2. Fittings
 - 3. Conductors
 - 4. Wiring devices
 - 5. Pressure connectors
 - 6. Lugs (CU-AL)
 - 7. Electrical insulating tape
 - 8. Heat-shrinkable tubing
 - 9. Cable ties
 - 10. Wire nuts
 - 11. Other items and accessories as required.
- B. Crimp on or slip-on type splicing materials designed to be used without wire stripping are not acceptable.

- C. Power Distribution Blocks: Provide Square D Type LB or Equivalent.
- D. Refer to other Division 26 Sections for specification of electrical materials as applicable.

PART 3 – EXECUTION

3.1 GENERAL:

- A. Make electrical connections in accordance with manufacturer's written instructions, applicable requirements of NEC, NEMA Standards, and NECA's "Standards of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.

3.2 CONNECTIONS:

- A. Permanently Installed Fixed Equipment:
 - 1. Install conductors in flexible conduit from junction box to equipment control panel or connection point.
 - 2. Where such installations are subject to moisture, install in liquid-tight flexible conduit.
- B. Movable equipment:
 - 1. Provide wiring devices, cord caps, and multi-conductor cables as required.
- C. Other methods as required by the NEC and/or as required by special equipment or field conditions.
- D. Power Distribution Blocks: Unless noted otherwise on drawings, provide power distribution blocks only for tapping of feeders and branch circuits. Locate in junction box or gutter in NEMA ratings to suit application.

3.3 MANUFACTURER'S INSTRUCTIONS:

- A. Obtain manufacturer's instruction and wiring diagram regarding electrical connections of each piece of equipment and provide connections in accordance therewith.

3.4 VERIFICATION OF LOAD CHARACTERISTICS:

- A. Verify electrical load characteristics of all equipment prior to rough-in. Review respective shop drawings of all other Divisions and Owner's equipment manuals. Report any variances from electrical characteristics noted in the contract documents to the Architect/Engineer prior to rough-in.
- B. Value of rough-in work, electrical equipment, etc. installed and/or purchased by the contractor not meeting equipment requirements shall be credited back to the owner.

END OF SECTION

SECTION 260072

ELECTRICAL SUPPORTS AND SEISMIC RESTRAINTS

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. Hangers and supports for electrical equipment and systems.
 - 2. Seismic restraints for electrical equipment and systems.
 - 3. Construction requirements for concrete bases.

1.3 DEFINITIONS:

- A. IBC: International Building Code.
- B. Seismic Restraint: A structural support element such as a metal framing member, a cable, an anchor bolt or stud, a fastening device, or an assembly of these items used to transmit seismic forces from an item of equipment or system to building structure and to limit movement of item during a seismic event.

1.4 SUBMITTALS:

- A. Product Data: Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of electrical support and seismic-restraint component used.
 - 1. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by an agency acceptable to authorities having jurisdiction.
 - 2. Annotate to indicate application of each product submitted and compliance with requirements.
- B. Shop Drawings: Indicate materials and dimensions and identify hardware, including attachment and anchorage devices, signed and sealed by a qualified professional engineer. Include the following:
 - 1. Fabricated Supports: Representations of field-fabricated supports not detailed on Drawings.
 - 2. Seismic Restraints: Detail anchorage and bracing not defined by details or charts on Drawings. Include the following:
 - a. Design Analysis: To support selection and arrangement of seismic restraints. Include calculations of combined tensile and shear loads.
 - b. Details: Detail fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions

- c. and values of forces transmitted to the structure during seismic events.
Preapproval and Evaluation Documentation: By an agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval (tests or calculations).
- C. Coordination Drawings: Show coordination of seismic bracing for electrical components with other systems and equipment in the vicinity, including other supports and seismic restraints.
- D. Welding certificates.
- E. Qualification Data: For professional engineer and testing agency.
- F. Field quality-control test reports.

1.5 QUALITY ASSURANCE:

- A. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.
- B. Testing of Seismic Anchorage Devices: Comply with testing requirements in Part 3.
- C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

PART 2 – PRODUCTS

2.1 MANUFACTURERS:

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS:

- A. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed under this Project, with a minimum structural safety factor of five times the applied force.
- B. Steel Slotted Support Systems: Comply with MFMA-3, factory-fabricated components for field assembly.
 - 1. Available Manufacturers:
 - a. Cooper B-Line; a division of Cooper Industries.
 - b. ERICO International Corporation.
 - c. Allied Support Systems; Power-Strut Unit.
 - d. GS Metals Corp.
 - e. Michigan Hanger Co., Inc.; O-Strut Div.
 - f. National Pipe Hanger Corp.
 - g. Thomas & Betts Corporation.
 - h. Unistrut; Tyco International, Ltd.

- i. Wesanco, Inc.
- 2. Finishes:
 - a. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-3.
- 3. Channel Dimensions: Selected for structural loading and applicable seismic forces.
- C. Raceway and Cable Supports: As described in NECA 1.
- D. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- E. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- F. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- G. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Verify suitability of fasteners in subparagraph below for use in lightweight concrete or concrete slabs less than 4 inches (100 mm) thick.
 - 2. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Available Manufacturers:
 - 1) Hilti, Inc.
 - 2) ITW Construction Products.
 - 3) MKT Fastening, LLC.
 - 4) Simpson Strong-Tie Co. Inc.
 - 3. In the following subparagraph, use stainless steel anchors in corrosive environments.
 - 4. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - a. Available Manufacturers:
 - 1) Cooper B-Line; a division of Cooper Industries.
 - 2) Empire Tool and Manufacturing Co., Inc
 - 3) Hilti, Inc.
 - 4) ITW Construction Products.
 - 5) MKT Fastening, LLC.
 - 6) Powers Fasteners.
 - 5. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
 - 6. Through Bolts: Structural type, hex head, high strength. Comply with ASTM A 325.
 - 7. Toggle Bolts: All-steel springhead type.
 - 8. Hanger Rods: Threaded steel.

2.3 SEISMIC-RESTRAINT COMPONENTS:

- A. Rated Strength, Features, and Application Requirements for Restraint Components: As defined in reports by an agency acceptable to authorities having jurisdiction.
 - 1. Structural Safety Factor: Strength in tension, shear, and pullout force of components

used shall be at least five times the maximum seismic forces to which they will be subjected.

- B. Angle and Channel-Type Brace Assemblies: Steel angles or steel slotted-support-system components; with accessories for attachment to braced component at one end and to building structure at the other end.
- C. Cable Restraints: ASTM A 603, zinc-coated, steel wire rope attached to steel or stainless-steel thimbles, brackets, swivels, and bolts designed for restraining cable service.
 - 1. Available Manufacturers:
 - a. Amber/Booth Company, Inc.
 - b. Loos & Co., Inc.
 - c. Mason Industries, Inc.
 - 2. Seismic Mountings, Anchors, and Attachments: Devices as specified in Part 2 "Support, Anchorage, and Attachment Components" Article, selected to resist seismic forces.
 - 3. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod, of design recognized by an agency acceptable to authorities having jurisdiction.
 - 4. Bushings for Floor-Mounted Equipment Anchors: Neoprene units designed for seismically rated rigid equipment mountings, and matched to type and size of anchor bolts and studs used.
 - 5. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for seismically rated rigid equipment mountings, and matched to type and size of attachment devices used.

2.4 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES:

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in [Division 5 Section "Metal Fabrications"](#) for steel shapes and plates.

PART 3 – EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 for application of hangers and supports for electrical equipment and systems, except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for raceways as within 12 inches of coupling, fitting, and box, at each 90 degrees bend, minimum of two supports per ten foot run. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
- C. Multiple Raceways: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with single-bolt conduit clamps, or as otherwise required by an agency acceptable to authorities having jurisdiction.

3.2 SUPPORT AND SEISMIC-RESTRAINT INSTALLATION:

- A. Comply with NECA 1 for installation requirements, except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, raceways may be supported by openings through structure members, as permitted in NFPA 70.
- C. Install seismic-restraint components using methods approved by the evaluation service providing required submittals for component.
- D. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).
- E. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Expansion anchor fasteners.
 - 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
 - 6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69 Spring-tension clamps.
 - 7. To Light Steel: Sheet metal screws.
 - 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.
- F. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.
- G. Do not drill or core cut holes for anchors or use powder-activated fasteners in post-tension slabs, joists, and beams.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS:

- A. Comply with installation requirements in [Division 5 Section "Metal Fabrications"](#) for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES:

- A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and seismic criteria at Project.

- B. Construct concrete bases of dimensions indicated but not less than 4 inches (100 mm) larger in both directions than supported unit, and so expansion anchors will be a minimum of 10 bolt diameters from edge of the base.
 - 1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around full perimeter of the base.
 - 2. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
 - 3. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 4. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 5. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
 - 6. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in [Division 3 Section "Cast-in-Place Concrete."](#)

3.5 INSTALLATION OF SEISMIC-RESTRAINT COMPONENTS:

- A. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.
- B. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- C. Restraint Cables: Provide slack within maximums recommended by manufacturer.
- D. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, upper truss chords of bar joists, or at concrete members.

3.6 FIELD QUALITY CONTROL:

- A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing: Test pullout resistance of seismic anchorage devices.
 - 1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
 - 2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless postconnection testing has been approved), and with at least seven days' advance notice.
 - 3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
 - 4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
 - 5. Test to 90 percent of rated proof load of device.
 - 6. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.
- C. Record test results.

END OF SECTION

SECTION 260110
CONDUIT RACEWAYS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.
- B. This section is a Division 26 General Provisions section, and is part of each Division 26 sections making reference to conduit raceways.

1.2 DESCRIPTION OF WORK:

- A. Extent of raceways is indicated by drawings and schedules.
- B. Types of raceways in this section include the followings:
 - 1. Rigid Metal Conduit
 - 2. Intermediate Metal Conduit
 - 3. Electrical Metallic Tubing
 - 4. Flexible Metal Conduit
 - 5. Liquid-tight Flexible Metal Conduit
 - 6. Rigid Non-metallic Conduit

1.3 QUALITY ASSURANCE:

- A. Standards: Refer to [Section 260001 – Electrical General Provisions](#) as applicable. Provide conduit raceway installation in accordance with recommendations of the American Iron and Steel Institute "Design Manual on Steel Electrical Raceways", latest edition.
- B. Manufacturers: Firms regularly engaged in the manufacture of raceway of types and sizes required, whose products have been in satisfactory service for not less than three (3) years.
- C. Shop Drawings: Not required.

PART 2 – PRODUCTS

2.1 CONDUITS:

- A. Rigid Metal Conduit (RMC): Provide zinc-coated, hot-dipped galvanized, rigid metallic conduit in accordance with Federal Specification WW-C-0581 and ANSI C80.1.
- B. Intermediate Metal Conduit (IMC): Provide hot-dipped galvanized, intermediate metal conduit in accordance with Federal Specification WW-C-581.
- C. Electric Metallic Tubing (EMT): Provide electric metal tubing in accordance with Federal Specification WW-C-563 and ANSI C80.3.

- D. Flexible Metal Conduit: Provide zinc-coated, flexible metal conduit in accordance with Federal Specification WW-C-566.
- E. Liquid-Tight Flexible Metal Conduit: Provide liquid-tight, flexible metal conduit, constructed of single strip, flexible continuous, interlocked, and double-wrapped steel, galvanized inside and outside, coated with liquid-tight jacket of flexible Polyvinyl Chloride (PVC).
- F. Rigid Non-Metallic Conduit: Provide rigid non-metallic conduit (PVC) in accordance with ANSI/NEMA TC 2, Type 1 for concrete encasement, Type 2 for direct burial.

2.2 FITTINGS:

- A. Rigid Metal Conduit, Intermediate Metal Conduit: Provide fully-threaded, malleable steel fittings, rain-tight and concrete-tight as applicable. Provide double locknuts and metal bushings at all conduit terminations. Install OZ Type B bushings on conduits 1-1/4" and larger.
- B. Electric Metallic Tubing: Provide insulated throat, non-indenter, set screw, malleable steel fittings. Screws must have a full set. Provide concrete-tight compression-type fittings in suspended slabs. All EMT fittings shall be fabricated from steel. Die-cast fittings or fittings made from pot metal shall not be allowed. Indenter type fittings are not acceptable. Install OZ Type B bushings on conduits 1" and larger.
- C. Flexible Metal Conduit: Provide flexible metal conduit fittings in accordance with Federal Specification W-F-406, Type 1, Class 1, and Style A. Commercial "greenfield" not less than 1/2" diameter or as otherwise specified on drawings is acceptable.
- D. Liquid-Tight Flexible Metal Conduit: Provide liquid-tight flexible metal conduit fittings in accordance with Federal Specification W-F-406, Type 1, Class 3, Style G.
- E. Non-Metallic Conduit: Provide non-metallic conduit fittings (PVC) in accordance with ANSI/NEMA TC 3 to match conduit types and materials.
- F. Expansion Fittings: OZ Type AX, or equivalent to suit application.
- G. Sealing Bushings: Provide OZ Type FSK, WSK, or CSMI as required by application. Provide OZ Type CSB internal sealing bushings.
- H. Cable Supports: Provide OZ cable supports for vertical risers, type as required by application.

2.3 SIZES:

- A. Provide conduits in sizes as indicated in contract documents or as otherwise specified herein, but not less than 3/4".

PART 3 – EXECUTION

3.1 GENERAL:

- A. Install raceway and accessories in accordance with manufacturer's written instructions, applicable requirements of NEC, NEMA Standards, and NECA's "Standards of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.

3.2 LOCATIONS:

- A. Rigid Metal Conduit and Fittings: Use for conduit bends greater than 22 degrees where buried below grade or slab on grade. Install RMC where raceway passes vertically through slab-on-grade. Where raceways penetrate building, manholes, or vault walls and floors below grade, provide RMC for a minimum distance of 10' on the exterior side of the floor or wall. Use RMC for exposed runs where conduit is subject to moisture, weather, or mechanical injury. Use in hazardous locations in accordance with all NEC requirements.
- B. Intermediate Metal Conduit and Fittings: Use for exposed runs where conduit is subject to moisture, weather, or mechanical injury. Use in hazardous locations in accordance with all NEC requirements.
- C. Electric Metal Tubing and Fittings: Use for above-grade feeders, branch circuits, and signal and control circuit, unless specifically noted otherwise on drawings. Install in suspended slabs subject to local code requirements and fire rating considerations.
- D. Flexible Metal Conduit and Fittings: Use as whips for lighting fixtures, fixed equipment where not exposed to weather or moisture, other devices where required by NEC, and as requested by the Engineer. Maximum length not to exceed 6', unless specifically approved by the Electrical Engineer.
- E. Liquid-Tight Flexible Metal Conduit and Fittings: Use for connection to motor terminal boxes, fixed equipment where subject to moisture or weather, and other equipment subject to movement or vibration. Maximum length not to exceed 6', unless specified otherwise.
- F. Rigid Non-Metallic Conduit and Fittings: Use for below-grade service entrances, feeders, branch circuits, and signal and control circuit, unless specifically noted otherwise on drawings. Do not use above grade.

3.3 METHODS:

- A. Maintain a minimum of 12" clearance between steam or hot water lines or other hot surfaces. Where such clearance is impractical, insulate conduit with approved materials.
- B. Install conduits parallel with or at right angles to lines of the structure. Route conduits symmetrically where possible.
- C. Field bends and offsets shall be made without flattening, kinking, rippling or destroying the smooth internal bore or surface of the conduit and to not less than NEC minimum radius. Conduit that shows signs of rippling or kinking shall not be installed. Conduits installed with wrinkles or kinks or otherwise in an unworkmanlike manner shall be replaced at no additional cost to owner.
- D. Precaution shall be exercised to prevent accumulation of water, dirt or concrete in the conduits during the execution of the project. Conduits in which water or foreign matter has been permitted to accumulate shall be thoroughly cleaned or the conduits runs replaced where such accumulation cannot be removed by methods approved the engineer.
- E. Any conduit which pierces airtight spaces or plenums shall be sealed to prevent air leakage with mastic acceptable to the Architect.

3.4 CONCEALING:

- A. All raceways shall be concealed within the ceilings, walls, and floors, except in locations where exposed raceways are specifically permitted, such as equipment rooms and unfinished storage areas. In equipment rooms, if lighting raceways are run exposed, installation shall not be done

until piping and duct work layout has been determined in order that lighting boxes may be located so as to avoid being covered by overhead ducts and piping. If lighting raceways in equipment rooms are concealed in the structural ceiling slab, after mechanical work is complete, exposed conduit extensions shall be run to locate lighting fixtures where they are not obscured by work of other trades.

3.5 BURIED CONDUITS:

- A. Comply with all burial depths as defined in NEC Section 300-5. Bury all conduits at least 24" below grade, unless specifically indicated otherwise on drawings. Provide magnetic 6" wide "Yellow Warning" ribbon 12" directly above conduit and 6" below finished grade measured from the top of the conduit or duct bank. Where multiple small lines are buried in a common trench and do not exceed an overall width of 16", install a single marker.
- B. Slope all conduits toward manholes or pull boxes for proper drainage. Use weep holes. Gravel drainage pockets are not permitted.
- C. Coat all metal conduits with an approved asphaltic compound or wrap with two layers of PVC tape.
- D. Under Concrete Slab on Grade: Horizontal conduit must be installed a minimum of 2" below the bottom of the concrete slab. Conduits should not be installed in concrete slabs.
- E. Concrete Encasement: Where concrete-encasement is indicated on drawings, provide ductbank construction using red 3000 psi at 28 day strength concrete. Provide minimum 4" cover on all sides of exterior conduits. Provide conduit spacers where applicable. Coat all metal conduits with an approved asphaltic compound or wrap with two layers of PVC tape.
- F. Where conduits are extended for future use, cap and clearly mark.

3.6 ELECTRICAL CONTINUITY:

- A. Provide electrically continuous conduit systems throughout.

3.7 FIELD CUTS AND THREADS:

- A. Cut all conduits square. Remove all sharp or rough edges and ream all burrs, inside and outside. Provide clean sharp threads on RMC and IMC.
- B. Engage at least five full threads on all RMC and IMC fittings. Before couplings or fittings are attached, apply one coat of red lead or zinc chromate to male threads of RMC or IMC. Apply coat of red lead, zinc chromate or special compound recommended by manufacture to conduit where conduit protective coating is damaged.

3.8 CONDUIT ENDS:

- A. Cap all spare conduits. Cap or plug conduit ends during construction to prevent entrance of foreign material.

3.9 SPARE CONDUITS:

- A. Install a 200 lb. polypropylene pull cord in each empty conduit run.

3.10 ROCKY MOUNTAIN POWER RACEWAY METHODS:

- A. Comply with all requirement of the current six state ESR manual, the entire document can be found at the following web address for downloading and printing:
<http://www.rockymountainpower.net/esr>
- B. The contractor shall provide all conduit systems for the required electrical utility work; raceway shall be PVC or RMC. All elbows shall be long-radius PVC, RMC, or fiberglass elbows complying with all ESR requirements. Sleeve conduits when conduit extends vertically through a paved surface. Provide 500 lb flat pull line or poly rope within each conduit. Proof all conduits with an 80% diameter mandrel witnessed by the Utility representative.
- C. The contractor shall provide trenching, boring, backfill, compactions, and surface repair.
- D. The contractor shall provide pre-case concrete pad/vaults for utility provided transformers as required.
- E. The contractor shall provide concrete pads for utility provided transformers as required.
- F. Install RMC and IMC in all hazardous locations as defined by the NEC. Provide suitable fittings, seal-offs, boxes, etc. to comply with all NEC requirements and/or as shown on the drawings. Provide inspection fittings with hazardous location rated drains to prevent water from accumulating in conduit runs.

3.11 CLEANING:

- A. Pull mandrel and swab through all conduits before installing conductors.

END OF SECTION

SECTION 260120
CONDUCTORS AND CABLES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.
- B. This section is a Division 26 General Provisions section, and is part of each Division 26 sections making reference to conductors and cables.

1.2 DESCRIPTION OF WORK:

- A. This section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.
- B. Types of conductors and cables in this section include the following:
 - 1. Copper Conductors.
- C. Applications for conductors and cables required for project include:
 - 1. Service Entrance.
 - 2. Branch Circuits.

1.3 SUBMITTALS:

- A. Product Data: For each type of conductor and/or cable indicated.
- B. Field Quality-Control Test Reports: From Contractor. Refer to [Section 260001 – General Electrical Provisions](#).

1.4 QUALITY ASSURANCE:

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 – PRODUCTS

2.1 GENERAL:

- A. Manufacturers: In other Part 2 articles where subparagraph titles below introduce lists, provide products by the manufacturer specified, subject to compliance with requirements.

- B. Ambient Conditions: Conductors used for branch circuits in areas where the ambient conditions exceed 30 degree C. shall be provided with insulation approved for that temperature.
- C. Wire Sizes: As indicated on electrical drawings or as specified herein, but in no case less than No. 12 AWG.

2.2 COPPER CONDUCTORS:

- A. Manufacturers:
 - 1. Cerro Wire & Cable Company.
 - 2. General Cable Technologies Corporation.
 - 3. Encore Wire Corporation.
 - 4. Southwire Incorporated.
- B. Refer to Part 3 "Conductor and Cable Applications" Article for application requirements.
- C. References and Ratings:
 - 1. ICEA S-95-658 / NEMA WC70.
 - 2. ASTM.
 - 3. UL Standard 83.
 - 4. UL Standard 1063 (MTW).
 - 5. Federal Specification J-C-30B.
 - 6. NEC.
- D. Conductor Material: Copper.
- E. Stranding: Solid conductor for No. 12 AWG, stranded for No. 10 AWG and larger.
- F. Conductor Insulation Types: Thermoplastic-insulated, Type THHN / THWN-2.

2.3 CONNECTORS AND SPLICES:

- A. Manufacturers:
 - 1. AFC Cable Systems, Inc.
 - 2. AMP Incorporated/Tyco International.
 - 3. Hubbell/Anderson.
 - 4. O-Z/Gedney; EGS Electrical Group LLC.
 - 5. 3M Company; Electrical Products Division.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.
- C. Splices for wire sizes #10 and smaller shall be screw-on type similar to scotch or ideal wing nut connectors. Crimp-on splices designed to be used without wire stripping are not acceptable.

PART 3 – EXECUTION

3.1 GENERAL:

- A. Install conductors, cables, and accessories as indicated, in compliance with manufacturer's

written instruction, applicable requirements of NEC, NECA's "Standards of Installation", and in accordance with recognized industry practices to ensure that products fulfill requirements.

3.2 CONDUCTOR AND CABLE APPLICATIONS:

- A. Service Entrance: As indicated on the electrical drawings.
- B. Branch Circuits:
 - 1. Exposed, including in crawlspaces: Copper conductors in raceway.
 - 2. Concealed in ceilings, walls, and partitions: Copper conductors in raceways.
 - 3. Concealed in concrete and below slabs-on-grade: Copper conductors in raceway.

3.3 INSTALLATION:

- A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means; including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
- D. When raceway is not required, install concealed cables parallel and perpendicular to surfaces of structural members, and follow surface contours where possible.
- E. Support cables according to other applicable specification sections.
- F. Seal around cables penetrating fire-rated elements to comply with applicable fire stop specification sections.
- G. Color Coding: Color code secondary service, feeder, and branch circuit conductors. Colors shall remain consistent throughout the project and shall match existing coding system where applicable.
 - 1. Conductor sizes No. 6 AWG and smaller: Colored insulation.
 - 2. Conductors sizes No. 4 AWG and larger: 2 inch (51 mm) band of Colored adhesive marking tape applied at all terminations, junction boxes, and pull boxes.
 - 3. Branch circuit switched-legs and travelers: Colored insulation (in colors other than those indicated below).
 - 4. Color-code 120/208V system conductors:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - d. Neutral A: White with Black stripe.
 - e. Neutral B: White with Red stripe.
 - f. Neutral C: White with Blue stripe.
 - g. Neutral (Shared when allowed): White
 - h. Ground: Green.
 - i. Isolated Ground: Green with yellow tracer.

3.4 HOMERUN CIRCUITS:

- A. Homerun circuits may be combined in common conduits at the option of the contractor in

compliance with the following:

1. Three-Phase Installations: Not more than three single-phase circuits in one conduit, unless specifically noted otherwise, if each circuit is from a different phase (a, b, or c).
2. Single-Phase Installations: Not more than two single-phase circuits in one conduit, unless specifically noted otherwise, if each circuit is from a different phase (a or b).

3.5 NEUTRAL CONDUCTORS:

- A. LINE-TO-NEUTRAL BRANCH CIRCUITS: Provide a dedicated neutral for each line-to-neutral branch circuit. Size the neutral conductor the same as the phase conductor. In each outlet or junction box containing multiple neutral conductors, tag each neutral to identify which circuit it serves.

3.6 VOLTAGE DROP:

- A. Provide branch circuit conductors in sizes such that voltage drop for branch circuits do not exceed 3 percent at the farthest outlet. Provide service, feeder, and branch circuit conductors so that the voltage drop on the entire electrical system does not exceed 5 percent at the farthest outlet. This shall be strictly followed regardless of the conductor sizes indicated on the electrical drawings. Increase conductor sizes (and conduits where necessary to comply with NEC conduit fill requirements) as necessary to accommodate this requirement. Calculations shall be based on the following:

1. Lighting Branch Circuits: Connected load plus 25% spare.
2. Appliance and Equipment Branch Circuits: Nameplate or NEC required load.
3. 120V Convenience Outlet Branch Circuits: 12 amps minimum, but in no case less than NEC loading requirements. Use the following schedule:

<u>Distance (feet)</u>	<u>Wire Size (AWG)</u>
0-80	#12
81-125	#10
126-200	#8
201-320	#6

4. Use the NEC method to calculate voltage drop.

3.7 CONNECTIONS:

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack. Use pig tails when wiring outlets.

3.8 FIELD QUALITY CONTROL:

- A. Testing: Perform the following field quality-control testing:
 1. Visual and Mechanical Inspection:

- a. Inspect cables for physical damage and proper connection in accordance with the electrical construction documents.
 - b. Test cable mechanical connections to manufacturer's recommended values with a calibrated torque wrench.
 - c. Check cable color coding for compliance with electrical specifications.
 2. Electrical Tests:
 - a. Perform insulation resistance test on each conductors for feeders 100 amps and greater with respect to ground and adjacent conductors. Applied potential shall be 1000 volts dc for 1 minute.
 - b. Perform continuity test to insure proper cable connection.
 3. Test Values:
 - a. Minimum insulation resistance values shall not be less than two megaohms.
- B. Test Reports: Prepare a written report and submit to the Electrical Engineer at the completion of the project. The report shall include the following:
 1. Test procedures used.
 2. Test results that comply with requirements.
 3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

END OF SECTION

SECTION 260135

ELECTRICAL BOXES AND FITTINGS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.
- B. This section is a Division 26 General Provisions section, and is part of each Division 26 sections making reference to electrical boxes and fittings.

1.2 DESCRIPTION OF WORK:

- A. Extent of electrical boxes and fittings work is indicated by drawings and schedules.
- B. Types of electrical boxes and fittings in this section include the following:
 - 1. Outlet Boxes
 - 2. Junction Boxes
 - 3. Pull Boxes
 - 4. Conduit Bodies
 - 5. Bushings
 - 6. Locknuts
 - 7. Knockout Closures
 - 8. Miscellaneous Boxes and Fittings

1.3 QUALITY ASSURANCE:

- A. Standards: Refer to [Section 260001 – Electrical General Provisions](#) as applicable.
- B. Manufacturers: Firms regularly engaged in the manufacturer of boxes and fittings required, whose products have been in satisfactory service for not less than three years.

PART 2 – PRODUCTS

2.1 WEATHERPROOF OUTLET BOXES:

- A. Provide corrosion-resistant, cast-metal weatherproof outlet boxes, of types, shapes, and sizes, with threaded conduit ends, cast metal coverplates with spring-hinged waterproof caps, face plate gaskets, and corrosion-resistant fasteners.

2.2 JUNCTION AND PULL BOXES:

- A. Provide code-gauge sheet steel junction and pull boxes, with removable screw-on covers and welded seams, of types, shapes, and sizes to suit each respective location and installation. Size all junction and pull boxes in accordance with NEC 314.28. Provide stainless steel nuts, bolts, screws, and washer.

2.3 CONDUIT BODIES:

- A. Provide galvanized, cast-metal conduit bodies of type, shapes, and sizes to suit respective locations and installation. Construct with threaded conduit entrance ends and removable covers. Provide corrosion-resistant screws.
- B. Aluminum boxes and fitting shall not be permitted.

2.4 CONDUIT CONNECTIONS:

- A. Box connectors 3/4" and larger shall be insulated, throat-type or equal type plastic bushings. Provide double locknuts and insulating plastic bushings for RMC and IMC terminating at panels and boxes.
- B. Where RMC penetrates building, manholes, or vault walls and floors below grade, provide sealing bushings with external membrane clamps as applicable. Provide segmented internal sealing bushings in all raceways penetrating building walls and slabs below grade, and in all above grade raceway penetrations susceptible to moisture migration into building through raceway. Where RMC terminates in manhole, vault, or pull box, provide insulated grounding bushings. Also see [Section 260135 – Electrical Boxes and Fittings](#).
- C. Install OZ type "B" connectors for all conduits 1" and larger.
- D. Provide cable supports in all vertical risers in accordance with NEC 300-19.

2.5 ACCESSORIES:

- A. Provide all accessories including, but not necessarily limited to, bushings, knockout closures, locknuts, offset connectors, etc. of types, shapes, and sizes to suit respective locations and installation. Construct of corrosion-resistant steel.

PART 3 – EXECUTION

3.1 GENERAL:

- A. Install electrical boxes and fittings in accordance with manufacturer's written instruction, applicable requirements of the NEC, NEMA Standards, and NECA's "Standards of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.

3.2 METHODS:

- A. Where outlet boxes are subject to weather or moisture, install weatherproof outlet boxes.
- B. Remove knockouts only for entering conduits. Provide knockout closures to cap unused knockout holes where blanks are mistakenly removed.
- C. Do not use condulets in place of elbows or junction boxes. Condulets in sizes 2" or larger shall not be used, unless specifically approved by the electrical engineer.
- D. Install boxes and conduit bodies in readily accessible locations. Install recessed boxes with faces of boxes or rings flush with finished surfaces. Seal all openings between outlet box and adjacent surfaces with plaster, grout, or similar suitable material.

- E. For stud construction, install boxes with rigid supports using metal bar hangers, or 2" X 4", 1" X 6" wood bridging between studs with screws. Welding or nailing boxes directly to metal joist and studs is not acceptable. Boxes set opposite in common wall shall have at least 10" of conduit between them. Securely fasten outlet boxes to structural surfaces to which attached.
- F. For concrete or masonry construction, solidly embed electrical boxes in concrete and masonry. Provide box supports as required to keep outlet boxes flush with finished surfaces.
- G. Coordinate location of all outlet boxes with millwork, back splashes, tackboards, etc.
- H. Install junction boxes or condulets in conduit runs as required at 100 foot maximum intervals on long runs. This shall apply to concrete junction boxes in grade and junction boxes within the building.
- I. Provide electrical connections for installed boxes.

3.3 IDENTIFICATION:

- A. Mark circuit number on exterior side of junction boxes located in ceilings such that circuits numbers are readily identifiable. For outlet boxes in wall, mark circuit numbers on interior sides of outlet boxes.
- B. Identification labels shall be as follows:

Normal Power	Black with White letters
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END OF SECTION

SECTION 260140

WIRING DEVICES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.
- B. This section is a Division 26 General Provisions section, and is part of each Division 26 sections making reference to wiring devices.

1.2 DESCRIPTION OF WORK:

- A. Extent of wiring device work is indicated by drawings and schedules.
- B. Types of electrical wiring devices in this section include the following:
 - 1. Receptacles

1.3 QUALITY ASSURANCE:

- A. STANDARDS: Refer to [Section 260001 – Electrical General Provisions](#) as applicable.
- B. SHOP DRAWINGS:
 - 1. Submit manufacturer's data on all electrical wiring devices.
 - 2. Where occupancy sensors are required, provide scaled drawing showing manufacturer's recommended locations.

PART 2 – PRODUCTS

2.1 GENERAL:

- A. Provide factory-fabricated wiring devices, in types, and electrical ratings for applications indicated and complying with NEMA standards Pub No. WD 1. nylon construction, 20 amp rating minimum.
- B. Provide wiring devices in colors selected by Architect/Engineer. Provide red receptacle outlets and toggle switches where devices are circuited to emergency power. Provide orange receptacle outlets where devices are circuited to UPS power.

2.2 RECEPTACLES:

- A. Provide duplex receptacles from one of the following manufacturers:

<u>Manufacturer</u>	<u>CO</u>	<u>GFCI</u>	<u>IG</u>
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Hubbell	5362	GF5362	5362IG
Pass & Seymour	5362	2091-S	IG6300
Leviton	5362	8899	5362-IG
Cooper	5362	VGF20	IG5362
Bryant	5362	GFR53FT	5362IG

B. Abbreviations are defined as follows:

1. CO- Convenience Outlet Duplex Receptacle
2. GFCI- Ground Fault Circuit Interrupter duplex Receptacle
3. IG- Isolated Ground Duplex Receptacle

C. Must have one-piece Brass back strap and back wire grounding clamp (Does not apply to GCFI or isolated ground).

2.3 COVERPLATES:

A. Weather-Protecting Device Enclosure: Where required for compliance with NEC 410-67 (receptacles installed outdoors for use other than with portable tools or equipment), provide weather-tight device covers which provide complete protection with the cord and cap inserted into the wiring device. Provide units which mount on either single or double gang devices. Provide device enclosures manufactured by one of the following:

1. Intermatic WP1020 or WP1030
2. Hubbell WP826MP
3. Pass & Seymour

PART 3 – EXECUTION

3.1 GENERAL:

A. Install wiring devices and accessories in accordance with manufacturer's written instruction, applicable requirements of the NEC, NEMA Standards, and NECA's "Standards of Installation", and in compliance with recognized industry practices to insure that products fulfill requirements.

3.2 METHODS:

- A. Install wiring devices only in electrical boxes which are clean and free from excess building materials, dirt, and debris. Do not install wiring devices until painting work is completed.
- B. Replace receptacles and/or coverplates which are damaged, stained, or burned.

3.3 GFCI RECEPTACLES:

- A. Provide separate neutral conductor from panel to each GFCI receptacle circuits.
- B. Do not wire standard receptacles on the load side of GFCI receptacle - Install GFCI receptacles.

3.4 TESTING:

- A. Prior to energizing circuitry, test wiring devices for electrical continuity and proper polarity connections. After energizing circuitry, test wiring devices to demonstrate compliance with requirements.

3.5 IDENTIFICATION:

- A. All devices shall be identified on the coverplate with panelboard name and circuit number.
- B. In each outlet, tag each wire to identify the circuit it serves.
- C. Identification labels shall be as follows:

Normal Power Black with White letters

END OF SECTION

SECTION 260170
DISCONNECT SWITCHES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.
- B. This section is a Division 26 General Provisions section, and is part of each Division 26 sections making reference to disconnect switches.

1.2 DESCRIPTION OF WORK:

- A. Extent of disconnect switch work is indicated by drawings and schedules and is specified herein.
- B. Type of disconnects in this section include the following:
 - 1. General Duty Disconnect Switches
 - 2. Heavy Duty Disconnect Switches

1.3 QUALITY ASSURANCE:

- A. STANDARDS: Refer to [Section 260001 – Electrical General Provisions](#) as applicable.
- B. SUBMITTALS:
 - 1. Product Data: Submit manufacturer's data on disconnect switches including specifications, installation instructions, etc.
 - 2. Shop Drawings: Submit dimensioned drawings of disconnects showing accurately scaled layouts of disconnects and enclosures.
 - 3. Equipment Room Layouts: Submit dimensioned drawings of all equipment rooms indicating spatial relationships to other proximate equipment. Insure that all code required clearances are maintained.

PART 2 – PRODUCTS

2.1 MANUFACTURERS:

- A. Subject to compliance with all requirements, provide disconnect switches (fusible and non-fusible) and fusible switches (in power panels) from one of the following:
 - 1. Cutler-Hammer
 - 2. General Electric
 - 3. Siemens
 - 4. Square D

2.2 GENERAL:

- A. Provide fusible and/or non-fusible disconnect switches and ancillary components of types, sizes, ratings, and electrical characteristics as indicated. Provide enclosures in NEMA ratings suitable for applications. Provide fuses as indicated; See [Section 260180 – Overcurrent Protective Devices](#).

2.3 GENERAL DUTY DISCONNECT SWITCHES:

- A. Provide 240 volt rated, general duty switches in sheet steel enclosures as indicated of types, sizes, ratings, and electrical characteristics indicated and as required to suit respective application. Provide general duty switches for circuits rated 240 volts or less. Construct of spring-assisted, quick-make, quick-break mechanisms. Provide solid neutral as required by application. Equip with operating handle capable of being locked in the OFF position. Provide Class R rejection fuse clips for fusible-type switches.

2.4 HEAVY DUTY DISCONNECT SWITCHES:

- A. Provide 600 volt rated, heavy duty switches in sheet steel enclosures as indicated of types, sizes, ratings, and electrical characteristics indicated and as required to suit respective application. Provide heavy duty switches for circuits rated greater than 240 volts, but less than 600 volts. Construct of spring-assisted, quick-make, quick-break mechanisms. Provide solid neutral as required by application. Equip with operating handle capable of being locked in the OFF position. Provide Class R rejection fuse clips for fusible-type switches.

PART 3 – EXECUTION

3.1 GENERAL:

- A. Install disconnects in accordance with manufacturer's written instructions, applicable requirements of NEC, NEMA standards, and NECA's "Standards of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.

3.2 IDENTIFICATION:

- A. Provide 1/16" thick black plastic laminate labels with 1/4" high lettering on the exterior of each disconnect indicating name of disconnect or load served. Bolt labels to enclosure. Mark on interior cover the source of power by indicating the panel and circuit number.

3.3 MOUNTING:

- A. Mount disconnects as indicated, but in no case higher than 6'-6" from finished floor to top of disconnect. Anchor enclosures firmly to walls and structural surfaces.

END OF SECTION

SECTION 260180
OVERCURRENT PROTECTIVE DEVICES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.
- B. This section is a Division 26 General Provisions section, and is part of each Division 26 section making reference to overcurrent protective devices.

1.2 DESCRIPTION OF WORK:

- A. Extent of overcurrent protective devices is indicated by drawings and schedules and is specified herein.
- B. Type of overcurrent protective devices in this section include the following:
 - 1. Molded Case Circuit Breakers

1.3 QUALITY ASSURANCE:

- A. STANDARDS: Refer to [Section 260001 - Electrical General Provisions as applicable](#).
- B. SUBMITTALS:
 - 1. SHOP DRAWINGS: Submit manufacturer's data on overcurrent protective devices including specifications, time-current trip characteristics curves, mounting requirements, installation instructions, etc. Submit dimensioned drawings of overcurrent protective devices.
 - 2. Equipment Room Layouts: Submit dimensioned drawings of all equipment rooms indicating spatial relationships to other proximate equipment. Insure that all code required clearances are maintained.

PART 2 – PRODUCTS

2.1 GENERAL:

- A. Provide overcurrent protective devices and ancillary components of types, sizes, ratings, and electrical characteristics indicated. Provide enclosures in NEMA ratings as indicated and suitable for applications.

2.2 MOLDED CASE CIRCUIT BREAKERS:

- A. MANUFACTURERS: Subject to compliance with all requirements, provide molded case circuit breakers from one of the following:

1. Cutler-Hammer
2. General Electric
3. Siemens
4. Square D

B. MOLDED CASE CIRCUIT BREAKERS:

1. Provide factory-assembled, molded case circuit breakers as integral components of lighting and appliance panelboards, power panelboards, switchboards, and for individual mounting as indicated. Provide thermal magnetic, molded case circuit breakers of amperages, voltages, types, and short circuit current ratings indicated. Provide bolt-on type breakers only. Construct with quick-break, quick-break mechanism with inverse-time delay and instantaneous trip protection for each pole. Provide breakers rated for ambient temperatures to suit respective applications. Provide mechanical screw type removable copper connector lugs of size to accommodate conductors specified.
2. Provide breakers that have interrupting ratings greater than or equal to the specified fault current. Provide fully-rated systems only. Series-rated systems are not acceptable, unless specifically noted otherwise.

PART 3 – EXECUTION

3.1 GENERAL:

- A. Install overcurrent protective devices in accordance with manufacturer's written instructions, applicable requirements of NEC, NEMA standards, and NECA's "Standards of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.

3.2 IDENTIFICATION:

- A. Provide 1/16" thick black plastic laminate labels with 1/4" high lettering on the exterior of each disconnect indicating name of disconnect or load served. Bolt labels to enclosure. Mark on interior cover the source of power by indicating the panel and circuit number.

3.3 MOUNTING:

- A. Mount disconnects as indicated, but in no case higher than 6'-6" from finished floor to top of disconnect. Anchor enclosures firmly to walls and structural surfaces.

END OF SECTION

SECTION 260420
SERVICE ENTRANCE

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.
- B. This section is a Division 26 General Provisions section, and is part of each Division 26 sections making reference to service entrances.

1.2 DESCRIPTION OF WORK:

- A. Extent of service entrance work is indicated by drawings and schedules and is specified herein.
- B. Work under this section includes the following:
 - 1. Power Company Coordination and Fees
 - 2. Power Company Transformer Pads
 - 3. Raceways and Conductors
 - 4. CT Enclosures
 - 5. Metering

1.3 QUALITY ASSURANCE:

- A. STANDARDS: Refer to [Section 260001 – Electrical General Provisions](#) as applicable.
- B. SUBMITTALS:
 - 1. Shop Drawings: Submit manufacturer's data on service entrance equipment and accessories. Submit dimensioned drawings of service entrance equipment.
 - 2. Equipment Room Layouts: Submit dimensioned drawings of all equipment rooms containing service entrance equipment indicating spatial relationships to other proximate equipment. Insure that all code required clearances are maintained.

PART 2 – PRODUCTS

2.1 GENERAL:

- A. Provide service entrance equipment and accessories of types, sizes, ratings, and electrical characteristics indicated or as otherwise required to provide a complete system. See other applicable sections.

2.2 POWER COMPANY COORDINATION AND FEES:

- A. Coordinate and comply with all power company requirements. Verify all costs for line extensions (both high voltage and low voltage conductors), underground service fees, etc. with

Power Company prior to bid. Include all costs in bid. Confirm location of point of service before bidding.

2.3 POWER COMPANY TRANSFORMER PADS AND VAULTS:

- A. Provide steel reinforced, concrete transformer pads and/or vaults of sizes and with openings in accordance with the latest standards and requirements of the local power company. Verify all requirements with Power Company prior to installation.

2.4 RACEWAYS AND CONDUCTORS:

- A. Provide service entrance raceways and conductors in accordance with [Section 260110 – Conduit Raceways](#), and [Section 260120 – Conductors and Cables](#).

2.5 CT ENCLOSURES:

- A. Provide CT enclosures complete with meter bases of types and sizes in accordance with all power company requirements. Provide steel reinforced, concrete pads with openings in accordance with same. [Refer to "Concrete Bases" under Section 260001 – Electrical General Provisions](#). Verify and comply with all power company requirements prior to installation.

2.6 METERING:

- A. Meter Bases: Provide meter bases in accordance with all power company requirements. Extend 1" empty conduit from meter bases to secondary compartment of power company transformer. Verify exact location of meter bases prior to installations.
 - 1. Meters:
 - a. Subject to compliance with all requirements, provide metering equipment from one of the following:
 - 1) General Electric
 - 2) Siemens
 - 3) Square D
 - 4) Cutler Hammer

PART 3 – EXECUTION

3.1 GENERAL:

- A. Install service entrance equipment and accessories in accordance with manufacturer's written instructions, applicable requirements of NEC, NEMA standards, and NECA's "Standards of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.

3.2 TRANSFORMER LOCATIONS:

- A. Verify and coordinate exact placement of concrete pad with local power company prior to installation. Strictly maintain sufficient distances from door, window, building walls and overhangs, gas meters, fuel tanks, etc. in accordance with all power company requirements. Field-verify placement of transformer pad in company with the local power company representative.

3.3 COORDINATION:

- A. Coordinate all service entrance work with other trades.
- B. Power Company Coordination: Coordinate installation of service entrance equipment with Power Company and insure that power to building is ready when needed. After the contract has been signed, immediately notify the engineer that the project is underway and indicated when power to the building/project is needed. It is the engineer's responsibility to complete and submit the power company service request form.

END OF SECTION

SECTION 260452

GROUNDING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.
- B. This section is a Division 26 General Provisions section, and is part of each Division 26 sections making reference to grounding.

1.2 DESCRIPTION OF WORK:

- A. Extent of grounding work is indicated by drawings and schedules and is specified herein.
- B. Ground the complete electrical installation including the system neutral, metallic conduits and raceways, boxes, fittings, devices, cabinets, equipment, and separately derived systems in accordance with the NEC and all other applicable codes to provide a permanent, continuous, low impedance, grounding system.
- C. Provide grounding system such that the resistance from the service entrance ground bus, through the grounding electrode to earth is not greater than 5 ohms.

1.3 QUALITY ASSURANCE:

- A. STANDARDS: Refer to [Section 260001 – Electrical General Provisions](#) as applicable.
- B. TESTING: Submit results of ground resistance testing as specified in this section. Include name of testing agency with report. Include test results in operation and maintenance manuals.

PART 2 – PRODUCTS

2.1 GENERAL:

- A. Provide grounding equipment and accessories of types, sizes, ratings, and electrical characteristics indicated or as otherwise required to provide a complete system.

2.2 GROUNDING CONDUCTORS:

- A. Unless noted otherwise, provide grounding conductors with stranding and insulation types to match phase conductors. Provide conductors with green insulation if possible; otherwise wrap with green tape. Size ground conductors as indicated on drawings. Do not size ground conductors smaller than that allowable by NEC.

2.3 GROUND RODS:

- A. Provide copper clad, steel, 3/4" diameter by 10' long, ground rods (Weaver, Cadweld, or

equivalent).

2.4 TEST WELLS:

- A. Provide precast concrete box 9-1/2" W. x 16" L. x 18" D. with light duty concrete cover for non-traffic areas or rated steel plate for traffic areas. Provide covers with lifting holes. Engrave cover with "Ground Rod".

2.5 CONCRETE ENCASED GROUNDING ELECTRODE (UFER GROUND):

- A. Provide a bare copper conductor encased along the bottom of concrete foundation or footing that is in direct contact with the earth and where there is no impervious water-proofing membrane between the footing and the soil. Size UFER ground conductor in accordance with the NEC. Extend conductor through a horizontal length of 30' minimum and encase with not less than 2 nor more than 5 inches of concrete separating it from surrounding soils.

2.6 INSULATED GROUNDING BUSHINGS:

- A. Provide plated malleable iron body with 150 degree Centigrade molded plastic insulating throat, lay-in grounding lug with hardened stainless steel fasteners (OZ Gedney BLG or equivalent).

2.7 BONDING JUMPERS:

- A. Provide bonding jumpers with hot dip galvanized malleable or ductile iron clamps, hot dip galvanized steel U-bolts, and tinned copper braids (OZ Gedney BJ Series or equivalent).

2.8 GROUND BUS:

- A. Provide 1/4" x 4", copper ground bus complete with insulators and brackets in lengths and at mounting heights as indicated on drawings. Furnish complete with drilled holes and lugs to accommodate grounding conductors.

PART 3 – EXECUTION

3.1 GENERAL:

- A. Install grounding systems in accordance with manufacturer's written instructions, applicable requirements of NEC, NEMA standards, and NECA's "Standards of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.

3.2 CLEANING:

- A. Thoroughly clean all metal contact surfaces prior to installation of clamp-on connectors.

3.3 SERVICE ENTRANCE GROUNDING:

- A. Connect the following items using NEC sized copper grounding conductors (in NEC sized, conduits if concealment is required) to lugs on the service ground bus:
 1. Conductor from the UFER ground.
 2. Conductor from two ground rods driven exterior to building at not less than 10' apart.
 3. Conductor from main incoming cold water piping system.
 4. Conductor from building structural steel.

5. Conductor from separately derived systems.
6. Conductor from insulated ground bushings on service entrance conduits.
7. Additional ground rods as required to achieve resistance value specified.
8. Additional items indicated on drawings.

3.4 EQUIPMENT BONDING AND GROUNDING:

- A. Provide an NEC sized conductor, whether indicated or not on the drawings, in raceways as follows:
 1. Non-metallic conduits and ducts.
 2. Distribution feeders.
 3. Motor and equipment branch circuits.
 4. Device and lighting branch circuits.
 5. Full length of all multi-outlet assemblies and other surface wireways.

3.5 ADDITIONAL GROUNDING INSTALLATION REQUIREMENTS:

- A. Provide grounding bushings on all service conduit and conduits installed in concentric/eccentric knock-outs or reducing washer at panelboards, cabinets, and gutters.
- B. Provide bonding jumpers across expansion and deflection couplings in conduit runs, across pipe connections at water meters, and across dielectric couplings in metallic cold water piping system. Connection to water piping system shall be made electrically continuous by connecting to the street side of the water main valve and/or installing additional bonding jumpers across the meter, valves or service unions that might be disconnected.
- C. Provide bonding wire in all flexible conduits.
- D. Isolated Ground Circuits: Circuits used for isolated ground outlets shall be run in separate raceways or shall have a separate green insulated ground conductor installed and tagged for identification at all outlet and junction boxes.

3.6 TEST WELLS:

- A. All ground rods shall be driven external to building and shall be located in ground well boxes. Locate in landscaped areas where possible.

3.7 TESTING:

- A. Obtain and record ground resistance measurements both from service entrance ground bus to the ground electrode and from the ground electrode to earth. Install additional bonding and grounding electrodes as required to comply with resistance limits specified under this Section. Use independent testing agency for all testing.

END OF SECTION

SECTION 260551

EXTERIOR AREA LIGHTING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.
- B. This section is a Division 26 General Provisions section, and is part of each Division 26 sections making reference to exterior area lighting.

1.2 DESCRIPTION OF WORK:

- A. Extent of exterior area lighting work is indicated by drawings and schedules and is specified herein.

1.3 QUALITY ASSURANCE:

- A. STANDARDS: Refer to [Section 260001 - Electrical General Provisions](#) and other sections as applicable.
- B. SHOP DRAWINGS: Submit manufacturer's data on exterior area lighting items including but not necessarily limited to poles, brackets, light fixtures, fuse, fuseblocks, etc. Submit dimensioned drawings of all pole and lighting fixtures. Include information with interior and exterior building lighting fixtures.

PART 2 – PRODUCTS

2.1 GENERAL:

- A. Provide exterior lighting fixtures of types as indicated on drawings or as approved by addenda.

2.2 LIGHT FIXTURES:

- A. Refer to light fixture schedule for requirements for exterior light fixtures, lamps, ballasts, etc.

2.3 POLES:

- A. Provide poles and all accessories including but not necessarily limited to anchor bolts, templates for anchor bolt pattern, brackets, bolts, etc. Provide handhole and cover at base of each pole. Provide poles which have been primed and painted at the factory. Provide poles, anchor bolts, etc. in sizes as recommended by manufacturer to withstand windloadings.

2.4 CONCRETE BASES:

- A. Provide 3000 psi class concrete, forms, steel reinforcement, tie wires, etc. as required. See drawings for details.

2.5 GROUND RODS:

- A. See [Section 260452 – Grounding](#) for ground rod requirements.

2.6 FUSEHOLDER, FUSES, AND BREAK-A-WAY RECEPTACLES:

- A. Provide fuseholders with break-a-way receptacles equivalent to Bussmann Tron Waterproof Fuseholders and Break-A-Way Receptacles in the base for all phase conductors and materials. Neutral fuse holder will use a shorting fuse insert. Provide Bussmann KTK-R fuses in ratings to suit respective applications and sized in accordance with all manufacturer's recommendations.

PART 3 – EXECUTION

3.1 GENERAL:

- A. Install exterior area lighting in accordance with manufacturer's written instructions, applicable requirements of NEC, NEMA standards, and NECA's "Standards of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.

3.2 INSTALLATION METHODS:

- A. Set all poles plumb. Use belt slings or ropes to raise and set poles to protect finish. Repair nicks and scratches to match original surface.
- B. Locate fuseholder at handhole. Provide fuse blanks in all neutral conductors.
- C. Grounding: Provide one ground rod for each light pole. Connect ground rod to pole by means of an NEC-sized grounding conductor and all additional grounding as required.

3.3 CONCRETE BASES:

- A. Provide concrete bases for light poles in accordance with details on drawings. Grout and hand-rub all concrete to a uniform smooth finish.

3.4 SPARE PARTS:

- A. FUSES: Provide three spare fuses for each type and size used.

3.5 WIRING METHODS:

- A. No common neutral multi-wire circuits will be used to feed area lighting. Provide dedicated neutral wire for each circuit indicated.

END OF SECTION

SECTION 31 0513

COMMON FILL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Common fill materials.

1.2 REFERENCES

- A. ASTM C 136: Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
- B. ASTM D 1883: Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils.
- C. ASTM D 2487: Standard Test Method for Classification of Soils for Engineering Purposes.
- D. ASTM D 2844: Test Method for Resistance R-Value and Expansion Pressure of Compacted Soils.
- E. ASTM D 3282: Standard Practice for Classification of Soils and Soil- Aggregate Mixtures for Highway Construction Purposes.
- F. ASTM D 3740: Standard Recommended Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

1.3 SUBMITTALS

- A. Prior to delivering material to site, identify.
 - 1. Name of Supplier and source
 - 2. Gradation of common fill material.
- B. If a change in source of material is required, submit name of Supplier, source and gradation analysis of material prior to delivery to site.

1.4 QUALITY ASSURANCE

- A. Use a laboratory that follows and complies with Section 01 45 00 and ASTM D 3740.
- B. Reject common fill products that do not meet requirements of this section.
- C. Remove any product found defective after installation and install acceptable product at no additional cost to OWNER.

PART 2 - PRODUCTS

2.1 BORROW

- A. Classifications A-1-a through A-4, ASTM D 3282.

2.2 GRANULAR BORROW

- A. Classifications A-1-a, A-1-b, A-2-4, or A-3, ASTM D 3282.
- B. Material meets design CBR-value (ASTM D 1883) or R value (ASTM D 2844) for suitability of source, not for project control testing.

2.3 GRANULAR BACKFILL BORROW

- A. Classification A-1, ASTM D 3282. B. Well graded.
- B. Particle size; 2 inch maximum.
- C. Material meets design CBR-value (ASTM D 1883) or R value (ASTM D 2844) for suitability of source, not for project control testing.

2.4 RECYCLED FILL

- A. Material: Pulverized portland cement concrete, pulverized asphalt pavement or combination, either mixed with or not mixed with a new aggregate.
- B. Gradation: Meet the requirements of this Section based upon use; e.g. borrow, granular borrow, granular backfill borrow, etc.

2.5 NATIVE

- A. When allowed by OWNER, material obtained from Excavations may be used as fill, provided organic material, rubbish, debris, and other objectionable materials are removed and CONTRACTOR has submitted the appropriate Proctor data.

2.6 CLAY

- A. Classification CL, CL-ML, or ML, ASTM D 2487.
- B. Free of organic matter, frozen material, debris, rocks, and deleterious materials.
- C. Homogeneous, relatively uniform.

2.7 SAND

- A. Friable river or bank aggregate, free of loam and organic matter.
Graded as follows.

Percent Passing

<u>Sieve</u>	<u>by Weight</u>
3/8	100
100	1 – 10

2.8 GRAVEL

- A. Material: Rock, stone, or other high quality mineral particle or combination.
- B. Gradation: ASTM D 448 narrow band.

1. Sewer Rock

<u>ASTM Nominal Size</u>	<u>Size No.</u>
3.5 to 1.5"	1

2.5 to 1.5"	2
2 to 1"	3
1.5 to 3/4"	4
1 to 1/2"	5

2. Pea Gravel.

<u>Nominal Size</u>	<u>ASTM Size No.</u>
3/4 to 3/8"	6
1/2 to No. 4	7
3/8 to No. 8	8
No. 4 to No. 16	9
No. 4 (screenings)	10

2.10 SOURCE QUALITY CONTROL

- A. Verify gradation, ASTM C 136.
- B. Select Samples on a random location and time basis.
- C. If tests indicate materials do not meet specified requirements, change materials and retest at no additional cost to OWNER.

END OF SECTION

**SECTION 31 2100
STRUCTURAL SOIL**

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the Structural Soil associated with the trees planted in tree grates and structural soil mix for driveable planting areas.
- B. Related Sections include the following:
 - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 CONTRACTOR SUBMITTALS

- A. General: The CONTRACTOR shall furnish a certificate with each delivery or bulk material delivery, stating source, quantity, and type of material. All materials shall conform to specification requirements. All certificates shall be delivered to the OWNER at time of each delivery. All bulk delivered materials shall be delivered with level load volume plainly marked on the truck bed.
- B. Submittals required:
 - 1. Existing Topsoil Analysis Report (including amendment recommendations) or Imported Topsoil Analysis Report (include topsoil analysis reports for all types topsoil used in structural soil mixes listed in this section).
 - 2. Compost Analysis Report

PART 2 - PRODUCTS

2.1 STRUCTURAL SOIL MIX FOR TREE GRATES

- A. Structural Soil Media
 - 1. Utelite 'Coarse' expanded shale: 83% (5 parts)
 - 2. Topsoil: 17% (1 part)
- B. Tree Pit Backfill Planting Mix
 - 1. Utelite 'Coarse' expanded shale: 50% (1 part)
 - 2. Topsoil: 50% (1 part)
- C. Components
 - 1. Utelite "Coarse" Lightweight Rotary Kiln Expanded Shale
- D. Acceptable Expanded Shale Manufacturer and Supplier:

Utelite Corporation, Scott Jenson, 801-243-9348
PO Box 387, Coalville, UT 84017
- E. Topsoil

1. Topsoil shall meet requirements of section 32 9300 "Landscape Planting"

2.2 STRUCTURAL SOIL MIX FOR DRIVEABLE PLANTING AREAS

A. Structural Soil Media

1. Utelite 'Fines' expanded shale: 60% (6 parts)
2. Sandy Topsoil: 30% (3 parts)
3. Organic Material 10% (1 part)

B. Components

1. Utelite "Fines" Rotary Kiln Expanded Shale

C. Acceptable Expanded Shale Manufacturer and Supplier:

Utelite Corporation, Scott Jenson, 801-243-9348
PO Box 387, Coalville, UT 84017

D. Sandy Topsoil

1. Topsoil shall meet requirements of section 32 9300 "Landscape Planting" and have at least 45% sand content and be screened of gravel.

E. Organic Material (Compost or Peat)

1. Compost
 - a. Contractor to provide compost soil analysis report to Owner/Architect at least one week prior to delivery. Compost soil analysis report shall be within one month of acquisition date.
 - b. Topsoil shall meet requirements listed above and be amended with 3 cubic yards of compost/1000 sq. ft. for every 3-inches of soil depth. Compost shall be incorporated into topsoil by rototilling. Compost shall meet all specifications below for either "Ideal" or "Acceptable" categories. Compost that falls within the "Not-Acceptable" range shall not be used.

COMPOST QUALITY GUIDELINES FOR LANDSCAPING*

	pH	Soluble Salts dS/m	Sodium Absorption Ratio (SAR)	Carbon:Nitrogen Ratio (C:N)%	Moisture%	> 98% Coarse Material Passing (dry weight basis)
Ideal	6 to 8	<5	<10	<20:1	25 to 35	3/8"
Acceptable	5-9	<10	<20	21:1 to 30:1	<25, >35	3/4"
Not-Acceptable	<5.0, >9.0	>10	>20	<10:1, >30:1	<20, >50	<98% 3/4"

*Von Isaman MS, Pres. Of QA Consulting and Testing, LLC., Dr. Rich Koenig, Utah State University Cooperative Extension Soils Specialist, and Dr. Teresa Cerny, USU Cooperative Extension Horticulturalist, 3 March 2003.

PART 3 - EXECUTION

3.1 MIXING - STRUCTURAL SOIL MIX FOR TREE GRATES

- A. Saturate the Utelite 'Fines' Expanded Shale with water and mechanically mix the 1 part topsoil to 5 parts Utelite Expanded Shale until a uniform distribution of the components is achieved.
- B. When stockpiling/g the finished mix, cover the pile with a tarp to prevent drying out and separation from rain.
- C. Install the mix within 24 hours of mixing.

3.2 MIXING - STRUCTURAL SOIL MIX FOR DRIVEABLE PLANTING AREAS

- A. Mechanically mix the sandy topsoil and organic material thoroughly at ratio of 3 parts sand or sandy soil to 1-part organic material.
- B. Mechanically mix 6 parts Utelite "Fines" with 3 parts sandy topsoil/organic material blend until the structural soil is thoroughly blended.
- C. When stockpiling/g the finished mix, cover the pile with a tarp to prevent drying out and separation from rain.
- D. Install the mix within 24 hours of mixing.

3.3 PLACEMENT

- A. Preparing the subgrade
 - 1. removing all organic matter, debris, loose material and large rocks.
 - 2. Dig out soft or mucky spots and replace with suitable material.
 - 3. Uniformly compact the subgrade to 90% of its maximum dry density.
- B. Place Structural Soil Mix over compacted subgrade per geotech report.
- C. Structural Soil Mx for Tree Grates shall be placed in 12-inch uniform lifts over the entire area of the project. Construction equipment, other than for compaction, shall not operate on the exposed Structural Soil.
- D. Structural Soil Mx for Driveable Planting Areas shall be placed in 10-inch uniform lifts over the entire area of the project. Construction equipment, other than for compaction, shall not operate on the exposed Structural Soil.

3.4 COMPACTION

- A. Compact using a vibratory plate, performing a minimum of four passes of not less than 10 seconds per pass, before moving to the next adjacent location. Additional passes may be required as determined by the field engineer. Continue placing and compacting in lifts until the specified depth is reached.
- B. For large areas, a small vibratory roller may be used. Compacted lifts should not exceed 12 inches and should receive 2 – 4 passes as determined by the field engineer.

3.5 PAVEMENT PLACEMENT

- A. The pavement subbase shall be placed as specified directly on the approved compacted Structural Soil.

3.6 TREE PIT PREPARATION

- A. Tree pit excavation:
 - 1. Excavate the Structural Soil to a depth equal to the height of the root ball of the tree to be planted taking care not to undermine the paved area.
 - 2. Place the tree in the pit and backfill as described below as soon as possible. No tree pit shall remain excavated for more than 2 hours unless forms are used.
- B. Tree Pit Backfill Planting Mix:
 - 1. Remove any wooden forms. Immediately place tree in the pit as detailed and backfill with the Tree Pit Backfill Planting Mix referenced in this specification.
 - 2. Hand tamp the planting mix in 12-inch lifts until the pit is filled to the specified grade.

3.7 PLANT MATERIAL INSTALLATION

- A. Install final layer of topsoil on top of compacted structural soil mx and install plant material as shown on drawings.

END OF SECTION

SECTION 31 2316

EXCAVATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Excavation and disposal of excavated materials.
- B. Protection of existing facilities, utilities, and structures affected by excavation.

1.2 DEFINITIONS

- A. Classified Excavation: The excavation of specified materials.
- C. Incidental Excavation: Excavation done for CONTRACTOR's benefit, excavation error, dewatering of Excavation, slough, or over-break.
- D. Unclassified Excavation: The excavation of all materials encountered regardless of the nature, size, or manner in which they are removed. Presence of isolated boulders or Rock fragments will not be sufficient cause to change classification of surrounding materials.

1.3 STORAGE AND HANDLING

- A. Stockpile excavated material to cause a minimum of inconvenience to public and provide for emergency services as necessary.
- B. Provide free access to all existing fire hydrants, water and gas valves, and meters.
- C. Provide free flow of storm water in all gutters, conduits, and natural water courses.
- D. Utilize traffic control signs, markers, and procedures in product storage and handling activities.
- E. Promptly remove other material from site.

1.4 SITE CONDITIONS

- A. Prior to excavation, photograph existing surfaces along which work may take place in order to determine, after construction is completed, whether any damage to existing improvements occurred prior to construction operations.
- B. Perform Incidental Excavation at no additional cost to OWNER.

PART 2 - PRODUCTS

2.1 MATERIALS FOR OVER EXCAVATED AREAS

- A. Common fill, Section 31 05 13.
- B. Crushed aggregate base, Section 32 11 23.
- C. Stabilization fill, crushed aggregate base or common fill with maximum rectilinear particle size of 2 inches.
- D. Stabilization fabric

PART 3 - EXECUTION

3.1 PREPARATION

- A. Use white paint and mark the proposed Excavation.
- B. Call the one-call center and wait the required amount of time. Color of one call center marks indicate the following.
 - 1. White: Proposed Excavation
 - 2. Pink: Temporary survey markings
 - 3. Red: Electric power lines, cables, conduit and lighting cables
 - 4. Yellow: Gas, oil, steam, Petroleum or gaseous materials
 - 5. Orange: Communications, alarm, signal, cables or conduits.
 - 6. Blue: Potable water.
 - 7. Purple: Reclaimed Water, irrigation and slurry lines
 - 8. Green: Sewer and storm drain lines

3.2 PROTECTION

- A. Identify required lines, grades, contours, and benchmarks.
- B. Pothole, expose or otherwise locate utilities as necessary to give utility company at least 4 days' notice to protect, preserve, or relocate a utility that interferes with or may be damaged by excavation work.
- C. Where utilities or structures conflict with design grades, report conflict to the appropriate utility company and OWNER 14 days prior to the initiation of work within the conflict area.
- D. Support and protect from damage any existing facility and structure that exists in, passes through, or passes under the site.
- E. No Contract Time extension shall be granted and no additional compensation shall be made if CONTRACTOR fails to pothole and identify buried utilities or structures which conflict with the Work.

3.3 SHORING

- A. Slope, shore, sheet, brace or otherwise support Excavations over 4 feet deep.
- B. When soil conditions are unstable, Excavations shallower than 4 feet deep must also be sloped, supported or shored.

3.4 DEWATERING

- A. Keep Excavation free from surface and ground water.
- B. If ground water table is in the intended construction operations, dewater Excavations.
- C. If there are no olfactory or visual indications of contamination in the water, discharge according to requirements of Federal, State or local agency having jurisdiction.
- D. If any evidence of contamination in the water, based on olfactory or visual indications, cease excavation work until potential risks are evaluated. During evaluation, handle water as a contaminated material.

- E. Pay for damages and costs resulting from dewatering operations.

3.5 GENERAL EXCAVATION REQUIREMENTS

- A. Excavate topsoil from areas to be re-landscaped or regraded and other marked areas.
- B. Excavate site to line and grade indicated.
- C. Carefully excavate soils in vicinity of buried utility marks placed by the one-call center.
- D. Where soil has been softened or eroded by flooding or hardened by drying during unfavorable weather, rework all damaged areas or replace with approved material at no additional cost to OWNER.
- E. Notify Owner of unexpected subsurface conditions.
- F. Underpin adjacent structure, service utilities and pipe chases that may be damaged by Excavation work.
- G. Protect Excavation walls as required. If conditions permit, slope Excavation Sides to maintain a safe and clean working area. Remove loose materials.
- H. Where OWNER deems Subgrade material to be susceptible to frost heave or otherwise unsatisfactory, excavate additional depth.

3.6 PATHWAY EXCAVATION

- A. In advance of setting line and grade stakes, clean Subgrade area of brush, weeds, vegetation, grass, and debris. Drain all depressions or ruts that contain water.
- B. Backfill and compact over excavation.

3.7 STRUCTURAL AND LANDSCAPE EXCAVATION

- A. Provide Shoring, cribs, cofferdams, caissons, pumping, bailing, draining, sheathing, bracing, and related items.
- B. For piling work, coordinate special requirements for piling. Protect Excavation walls.
- C. If conditions permit, slope Excavation Sides as excavation progress. Maintain a safe and clean working area.
- D. Support Excavations. Do not interfere with the bearing of adjacent foundations, pipelines, etc.

3.8 TRENCH EXCAVATION

- A. Grade bottom of Trenches to provide uniform bearing surface.
- B. If necessary, make bellholes and depressions required to complete joining of pipe or box.
- C. Limit width of Trench excavations to the dimensions suitable for worker access per pipe manufacturer's recommendation. Provide enough space for compaction equipment. Notify OWNER if excavation operations exceed any indicated line and grade limits.
- D. Protect Trenches overnight.

3.9 EXTRA EXCAVATION

- A. If unstable material is encountered at the bottom or face of any excavation, do not

perform extra excavation without written consent.

- B. Correct excavations beyond the specified lines and grades by filling and compacting the resulting voids with acceptable fill.
- C. Volume of Excavation within any specified pay limit will be determined by the method of average-end-areas in the original position.

3.10 TOLERANCE

- A. Grading: Top surface of Subgrade = plus or minus 1 inch.

END OF SECTION

SECTION 31 2326

COMPACTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Compaction of granular fill materials.

1.2 REFERENCES

- A. ASTM D 698: Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
- B. ASTM D 1557: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
- C. ASTM D 2216: Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock.
- D. ASTM D 2922: Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- E. ASTM D 3017: Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
- F. ASTM D 3282: Standard Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.
- G. ASTM D 3740: Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

1.3 DEFINITIONS

- A. A-1 Soil: Defined in ASTM D 3282.
- B. Modified Proctor Density: The maximum laboratory density, as defined in and determined by ASTM D 1557 using procedure A, B or C as applicable.
- C. Relative Density (or Relative Compaction): The ratio of field dry density to the maximum laboratory density expressed as a percentage.
- D. Standard Proctor Density: The maximum laboratory density, as defined in and determined by ASTM D 698 using procedure A, B or C as applicable.

1.4 QUALITY ASSURANCE

- A. Use a laboratory that follows and complies with ASTM D 3740.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 COMPACTION

- A. Moisten or dewater backfill material to obtain optimum moisture for compaction.
- B. Correct deficient compaction conditions. Replace or repair materials and damaged facilities.
- C. When no density compactive effort is specified, compact the entire area to eliminate unstable zones.

3.2 FIELD QUALITY CONTROL

- A. Testing: Owner to contract with Testing Laboratory for testing of materials.
 - 1. Because of changes in source of materials or proportions requested by CONTRACTOR.
 - 2. Because of Failure of materials to meet specification requirements.
 - 3. For other testing services needed or required by CONTRACTOR.
- B. Report: For each material tested, record the following.
 - 1. Vertical and horizontal location of the test.
 - 2. Optimum laboratory moisture content.
 - 3. Field moisture content.
 - 4. Maximum laboratory dry density.
 - 5. Field density.
 - 6. Percent compaction results.
 - 7. Certification of test results by testing agency.
- C. Optimum Soil Density: Use ASTM D 2216 and the following industry standards.
 - 1. For A-1 Soils: Use test method C of ASTM D 1557 (Modified Proctor)
 - 2. For All Other Soils: Use test method C of ASTM D 698 (Standard Proctor).
- D. Field Density:
 - 1. Use ASTM D 3017 and test method C of ASTM D 2922 for shallow depth nuclear testing.
 - 2. No density determinations are required on any material containing more than 65 percent material retained on the number 10 sieve or more than 60 percent material retained on the number 4 sieve. In lieu of reporting densities in such cases, report the sieve analysis to document the material type.

END OF SECTION

SECTION 32 1123
CRUSHED AGGREGATE BASE

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Treated or untreated base course requirements.

1.2 REFERENCES

- A. ASTM C 29: Standard Test Method for Unit Weight and Voids in Aggregate.
- B. ASTM C 131: Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- C. ASTM C 136: Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
- D. ASTM D 75: Standard Practice for Sampling Aggregates.
- E. ASTM D 448: Standard Classification for Sizes of Aggregate for Road and Bridge Construction.
- F. ASTM D 1883: Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils.
- G. ASTM D 2419: Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
- H. ASTM D 3665: Standard Practice for Random Sampling of Construction Materials.
- I. ASTM D 3740: Standard Recommended Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- J. ASTM D 4318: Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- K. ASTM D 5821: Standard Test Method for Determining the percentage of Fractured Particles in Coarse Aggregate.

1.3 DEFINITIONS

- A. Aggregate Grading Band: Allowable deviation from Target Gradation Curve based upon the number of gradation tests in a Lot. It is possible that gradation for any sieve may lie outside of its respective Master Grading Band limits.
- B. Master Grading Band: Gradation limits allowed for various sieve sizes ranging from the maximum size sieve to the No. 200 sieve.
- C. Mean of Deviations: The sum of the absolute values of the variance between each screen target value and each measured value divided by the number of tests in the Lot.
- E. Target Gradation Curve: A smooth locus of points within the limits of the Master Grading Band.

1.4 SUBMITTALS

- A. Name of Supplier and aggregate source.
- B. Target Gradation Curve.

1.5 QUALITY ASSURANCE

- A. Use a laboratory that follows and complies with Section 01 45 00 and ASTM D 3740.

1.6 ACCEPTANCE

- A. Treated or Untreated Base Course
1. Owner is not obligated to accept changes in Target after any material is delivered to site.
 2. Suitability of Source: Meet Table 2 properties.

PART 2 - PRODUCTS

2.1 UNTREATED BASE COURSE (ROAD BASE)

- A. Material: Crushed rock, gravel, sand or other high quality mineral particle, or combination.

Table 2 – Properties					
Physical Property	Units	Aggregate Class			ASTM Test
		A	B	C	
Dry Rodded Unit Weight, min.	lb/ft ³	75			C 29
Liquid Limit, max.		25			D 4318
Plastic Index, max.		0	0	6	D 4318
Sand Equivalent, min.	percent	35			D 2419
Wear (hardness), max.	percent	50			C 131
Gradation		Table 3			C 136
Two Fractured Faces, min.	percent	90	50	50	D 5821
CBR, min.	percent	70	55	40	D 1883
NOTES					
(a) Liquid limit, plastic limit, sand equivalent: Passing No. 40 sieve.					
(b) Wear: Retained on No. 8 sieve.					
(c) CBR: Use a 10 lb surcharge measured at 0.20 inch penetration at 95 percent of modified Proctor.					
(d) Faces: Retained on No. 4 sieve.					

Table 3 – Gradation			
US Sieve Size	Master Grading Bands Limits		
	Grade 1-1/2	Grade 1	Grade 3/4
2"	—	—	—
1-1/2"	100	—	—
1"	—	100	—
3/4 "	81 – 91	—	100
1/2 "	67 – 77	79 – 91	—
3/8"	—	—	78 – 92
No. 4	43 – 53	49 – 61	55 – 67
No. 16	23 – 29	27 – 35	28 – 38

2.2 ASPHALT TREATED BASE COURSE

- A. Meet requirements of this Section Article 2.1 and the following.
 - 1. Sand equivalent and fractured face measured after asphalt residue is burned off.
 - 2. Plasticity and wear requirements apply to virgin aggregate portion only.
 - 3. Allowable asphalt content is controlled by CBR.
- B. If aggregate contains RAP.
 - 1. Screen crushed RAP to remove debris.
 - 2. Mechanically blend virgin and RAP aggregates. Do not use windrows for blending.

2.4 SOURCE QUALITY CONTROL

- A. Sample, ASTM D 75 on a random basis, ASTM D 3665.
- B. Reject crushed aggregate base products that do not meet requirements of this Section.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Remove any product found defective after installation and install acceptable product at no additional cost to the OWNER.

END OF SECTION

SECTION 32 14 40

SITE STONE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Materials and procedures for installing the following stone products:
 - 1. Landscape Boulder
 - 2. Landscape Boulder Retaining Wall

1.2 SUBMITTALS

- A. At least thirty (30) days prior to ordering materials, the Contractor shall submit photos and stone source information for the Owner's Authorized Representative (OAR) approval. No materials shall be ordered or delivered until the required submittals have been reviewed and stamped approved by the Owner's representative. Delivered materials shall match the approved samples. Approval shall not constitute final acceptance. The Owner's representative reserves the right to reject, on or after delivery, any material that does not meet these Specifications. Submittals are required for the following:
 - 1. Landscape Boulder
 - 2. Landscape Boulder Retaining Wall

1.3 QUALITY ASSURANCE

- A. Verify drawing dimensions with actual field conditions. Inspect related work and adjacent surfaces. Report to the Owner's representative all conditions which prevent proper execution of this work, or that are different from those shown.
- B. Contractor must have successfully completed at least 3 stone applications of similar size and scope and will assign installers from these earlier applications to the Project, of which one will serve as lead installer.
- C. All materials and methods of installation shall conform to federal, state, and city codes and regulations having jurisdiction. Where Contract requirements are in excess of applicable standards the Contract provision shall govern.
- D. Each product shall be mined out of a single quarry. The quarry shall provide material of a consistent quality in appearance and physical properties to include the capacity to cut and finish the material.
- E. The Contractor shall take proper precautions not to damage any existing site conditions specifically excluded or accepted from the Contract and will be held solely responsible for any damage occurring during the course of the work under construction. The Contractor shall, at his own expense; make any and all repairs as required to restore to the original condition any area or item so damaged.
- F. Pre-installation Conference: Conduct conference at project site

- G. During the construction period, the Contractor shall take special measures including, but not limited to, wetting down, adding approved dust palliatives, etc., to control dust on site, in order to prevent annoyance and/or damage to adjacent property whether public or private.
- H. Product Handling
 - 1. Protect site stones against soilage. Protect sand against intermixture with earth or other types of materials.

PART 2 - PRODUCTS

2.1 LANDSCAPE BOULDER

- A. Landscape boulders shall vary in size from minimum 24" diameter to maximum 48" diameter and varying sizes between
 - 1. Color: sandstone
 - 2. Submit photos for approval

2.2 LANDSCAPE BOULDER RETAINING WALL

- A. Landscape boulders shall vary in size from minimum 24" diameter to maximum 48" diameter and varying sizes between
 - 1. Color: sandstone
 - 2. Submit photos for approval

PART 3 - EXECUTION

3.1 PREPARATION

- A. Layout: Check final elevations for conformance to Drawings

3.2 INSTALLATION

- A. Install as indicated on drawings.

END OF SECTION

SECTION 32 8000 LANDSCAPE IRRIGATION SYSTEM

PART 1 - GENERAL

1.1 THE REQUIREMENT

- A. The CONTRACTOR shall construct an automatic irrigation system, complete and operable, in accordance with the requirements of the Contract Documents.
- B. Said irrigation system shall include but not be limited to all pipes, fittings, irrigation heads, valves, pump assemblies, automatic control valves, controller, valve boxes, drain valves, quick coupler valves, operating wrenches, riser assemblies, direct burial wires, electrical connections, filter, wiring and other appurtenances, piping, connections, testing, cleaning-up, maintenance and adjustments necessary for a complete operating system, ready for immediate use upon completion. Minor items necessary for proper construction and functional operation of this system, not specifically described in the Contract Documents, shall be included as a part of the work of this Section.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. **Codes:** All codes, as referenced herein, are as specified in Division 01.
- B. Commercial Standards:
 - ASTM B 3 Specification for Soft or Annealed Copper Wire
 - ASTM D2564 Specification for Solvent Cements for Poly (VinylChloride) (PVC) Plastic Pipe and Fittings
 - AWWA C 500 Gate Valves for Water and Sewerage Systems

1.3 CONTRACTOR SUBMITTALS

- A. Manufacturer's literature, samples (where requested by the Owner) and installation instructions shall be submitted in accordance with Division 01 Section "Contractor Submittals."
- B. Record drawings, showing actual locations of all valves, pipes (lines), heads, dimensions, controllers, control lines, and electrical wires shall be submitted prior to final inspection. Diagrammatic location of irrigation system components is not acceptable when submitting record drawings – actual location of irrigation system equipment is required for locating in the field
 - 1. Actual routing of mainline with dimensions from fixed points.
 - 2. Actual routing of control wiring with dimensions from fixed points.
 - 3. Location of wire splices (must be placed in valve box and only use splices in approved locations)
 - 4. Actual routing of lateral lines and head locations
 - 5. Actual location of valve boxes with notes on type of valve used at each location.
 - 6. Actual location of sleeves with dimensions from fixed points.
 - 7. Actual location of stubbed mainlines or lateral lines (if applicable)
 - 8. Provide legend of symbols/notes used on record drawings.
 - 9. Any other notes as necessary to enable the owner to understand and locate irrigation system equipment in the field upon completion of the project.

- C. Controller literature, specifications, installation wiring diagram, and circuit breaker information shall be submitted to the OWNER for review prior to ordering.
- D. **Equipment for Operation:** The CONTRACTOR shall **provide the following** equipment, in addition to what is indicated on the Drawings.
 - 1. Two keys for locking automatic controller door.
 - 2. One Gate valve key.
 - 3. Two keys for locking valve boxes.
 - 4. 2 Valve Keys for Quick Coupler – coordinate with Owner.
 - 5. One Valve Key for Manual Drain Valve.
- E. A reduced copy of the irrigation plan shall be laminated and mounted in the controller.

1.4 QUALITY ASSURANCE

- A. In addition to other inspections, as provided by the OWNER, the CONTRACTOR shall give at least 72 hours' notice to the OWNER for scheduling the following special inspections:
 - 1. Layout of the system
 - 2. Inspection of trenches, backfilling, and equipment.
 - 3. Pressure tests
 - 4. Coverage adjustment
 - 5. Automatic operation
- B. The CONTRACTOR shall notify the OWNER at least 72 hours prior to performing the tests. All tests shall be performed in the presence of the owner's representative. Test requirements shall be as follows:
 - 1. After assembly and installation, all water pipes, fittings, automatic equipment, and appurtenances shall be tested at a hydrostatic pressure of 150 psi at the lowest point of the system for not less than 60 minutes.
 - 2. The first test shall be made in such a manner that all valves in the new water pipe irrigation lines will be tested for watertight closure. Valves may be tested in groups or singly while subjected to 150 psi water pressure for a period of not less than 60 minutes.
 - 3. The second test shall be made by forcing all air from the pipes with water and capping or plugging pipe risers. After the pipe risers have been plugged or capped, all line valves shall be fully opened and the pipe lines subjected to the full static water pressure for a period of not less than 120 minutes. Pressure pipelines 150 PSI).
 - 4. The third test required that lateral lines be tested at 100 psi for 120 minutes.
 - 5. The fourth test requires that all pressure lines be tested at 120 psi for 24 hours.
 - 6. Water lines and valves which show evidence of leakage or fail to be watertight shall be repaired or replaced. After all repairs or replacements have been made, the above-required tests shall be performed again.
 - 7. When the irrigation system is completed, the CONTRACTOR, in the presence of the OWNER, shall perform test coverage of water afforded the lawn and planting areas. The CONTRACTOR shall furnish all material and perform all work required to correct any inadequacies of coverage disclosed. The CONTRACTOR shall inform the OWNER of any deviation from the Drawings required due to wind, planting, soil, or site conditions that bear on proper coverage.
 - 8. Upon completion of each phase of the work, the CONTRACTOR shall check and adjust each irrigation head to meet the site requirements and the requirements of the Contract Documents.

(Testing as noted above is at the owner's option, and generally will not be required unless verification of the contractor's workmanship and quality is required.)

- C. All General laborers or workers on the Project shall be previously trained and familiar with sprinkler installation, and have a minimum of one-year experience.

1.5 INSTRUCTION

- A. The CONTRACTOR shall, upon completion of the maintenance period of the irrigation instruct the OWNER and the OWNER'S personnel as to the proper operation and maintenance of the system.

1.6 EXISTING UTILITIES AND CONDITIONS

- A. Prior to cutting into the soil, the CONTRACTOR shall locate all cables, conduits, sewers, septic tanks, and other such underground utilities, and shall take proper precautions not to damage or disturb such improvements. If a conflict exists between such obstacles and the proposed work, the CONTRACTOR shall promptly notify the OWNER
- B. The CONTRACTOR shall be responsible for coordinating its work with the operation of existing utilities and new utilities on the Project. The CONTRACTOR shall notify the OWNER or its representative when utilities which are in operation require shut-off.
- C. Due to the scale of Drawings, it is not possible to indicate all offset, fittings, etc., which may be required. The CONTRACTOR shall carefully investigate the structural and finished conditions affecting all its work, and plan its work accordingly, furnishing such fittings, etc., as may be required to meet such conditions. The Contract Documents are generally diagrammatic and indicative of the work to be installed. The work shall be installed in the most direct and workmanlike manner, so that conflicts between irrigation systems, planting, structures, piping, and etc. will be avoided.
- D. The CONTRACTOR shall verify the water pressure available at the site before installation of the system to make sure there is adequate pressure (design pressure 30 to 40 psi) to properly operate irrigation heads and valves, and shall also provide pressure reducing valves if required before commencement of any work. Minor additions and adjustments of heads, piping, and circuits shall be made at no additional cost to OWNER where it is necessary to make the irrigation system operate properly.

1.7 STORAGE OF MATERIALS

- A. The CONTRACTOR shall be responsible for storage of materials and for damage to the WORK covered by these Contract Documents before final acceptance of its work. The CONTRACTOR shall securely cover openings into the system, and shall cover all apparatus, equipment, and appliances both before and after being set in place to prevent obstruction in the pipes and the breakage, misuse, or disfigurement of said apparatus, equipment, or appliances.

1.8 SCHEDULING AND COORDINATION

- A. The CONTRACTOR shall be responsible for making arrangements for the coordination of its construction operations with those of all others on the job. The CONTRACTOR shall permit others engaged in work to accomplish their portion of the WORK without undue interference or delay.

- B. The CONTRACTOR shall be responsible for the scheduling and coordination of the electrical and water connections and the installation of the piping and equipment in a manner that will affect the earliest completion of the WORK in conformance with the construction progress schedules.
- C. If electrical service is not already in place, the Contractor will be required to make all necessary arrangements with the power utility 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.

1.9 GUARANTEE/WARRANTY OF THE IRRIGATION SYSTEM

- A. The CONTRACTOR shall guarantee the complete irrigation system to be free from leaks or breakage due to defective material or workmanship for a period of one year from the date of acceptance of the complete work by the OWNER. Damage due to sabotage and/or vandalism is specifically excepted from this guarantee.
- B. Other items of the required guarantee shall be as specified in the Division 32 Section "Landscape Planting".
- C. The CONTRACTOR shall repair any settling of backfilling trenches occurring during a one year period after final acceptance without expense to the OWNER including complete restoration of all damaged planting, paving, or other improvements of any kind.
- D. The CONTRACTOR shall provide winterization of the irrigation system during the one year guarantee period.
- E. When defective material or workmanship is discovered which will require repair or replacement, all such repair work or replacement work shall be done by the CONTRACTOR at its own expense within 24 hours after written notification is given to the CONTRACTOR by the OWNER of such required repairs. However, if the CONTRACTOR fails to comply with the requirements of the above guarantee within the 24 hours after notification is given, the OWNER shall proceed to have the repairs made by others at the CONTRACTOR'S expense.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Brand names specified for materials are supplied for the purpose of describing the type, size, quality, and performance of materials in the Irrigation Schedule. The CONTRACTOR may propose other manufacturers and models, as substitutions for those other than indicated in the Irrigation Schedule, if the materials are of equal quality and performance to the OWNER for review in accordance with Division 01 Section "Contractor Submittals." Any proposed irrigation equipment submitted by the contractor for approval as proposed substitution shall hydraulically match the originally specified equipment in the Drawings (i.e. flow rate, precipitation rate, friction loss, etc.)
- B. The CONTRACTOR shall furnish, at no additional charge, all samples necessary for testing as outlined in the Specifications or, when requested, certified evidence of off-site testing

- C. Equipment compatibility: automatic controller and automatic (remote) control valves shall be products of the same manufacturing company.
- D. The electrical point of connection for the irrigation system automatic controller shall be 120-volt electrical supply or as per manufacturer's recommendations.

2.2 PLASTIC PIPE AND FITTINGS

- A. Pipe shall be continuously and permanently marked with the following information: manufacturer's name, nominal pipe size, PVC type, pressure rating, and extrusion date.
- B. All plastic pipes for lateral lines shall be PVC (polyvinyl chloride) SDR 21, Schedule 40, NSF approved.
- C. Materials for pressure main lines shall be PVC (polyvinyl chloride) SDR 21, Schedule 40, NSF approved, or galvanized steel pipe.
- D. Pipe and Fittings Table:

Size	Mainline Piping	Mainline Fittings	Lateral Piping	Lateral Fittings
1"	SCH 40	SCH 40	SCH 40	SCH 40
1-1/4"	SCH 40	SCH 40	SCH 40	SCH 40
1-1/2"	SCH 40	SCH 40	SCH 40	SCH 40
2"	SCH 40	SCH 80	SCH 40	SCH 80
2-1/2"	SCH 40	SCH 80	SCH 40	SCH 80
3"	SCH 40	Mechanical Joint Restraint System Fittings	SCH 40	Mechanical Joint Restraint System Fittings
4"	PVC Class 200 Gasketed	Mechanical Joint Restraint System Fittings	PVC Class 200 Gasketed	Mechanical Joint Restraint System Fittings
6"	PVC Class 200 Gasketed	Mechanical Joint Restraint System Fittings	PVC Class 200 Gasketed	Mechanical Joint Restraint System Fittings

- E. Ductile iron fitting shall be grade 65-45-12 in accordance with ASTM A-536. Fitting shall be deep bell push-on joints with gaskets meeting ASTM F-477. Fittings shall be Harco Deep Bell or approved equal. Transition gaskets are not allowed.
 - a. Any and all Ductile Iron fittings shall include Joint Restraints at each fitting.
 - b. All Ductile Iron fittings shall come from a manufacturer offering a 10 year warranty on products and replacement labor costs. Prior to install, Contractor shall provide OAR documentation from the manufacturer shall provide documentation stating the above warranty information, including the labor reimbursement hourly rate.

- c. All Ductile Iron fittings and joint restraints shall have a fusion bonded epoxy coating on interior and exterior of the product surface, average of 10-12mm thickness. Epoxy coating shall conform to the requirements of CSA Z245.20-20 and NSF 61 for water services. Tar/bitumen coating will not be approved.
 - d. All bolts used in fittings to be stainless steel.
- F. Swing joint ells and nipples shall be Schedule 80 PVC or galvanized as noted on Drawings.
- G. Control wiring conduit
 - 1. rigid non-metallic schedule 40 PVC
 - 2. UL listed: meets requirements of UL 651
 - 3.

2.3 VALVES

- A. Gate valves shall be as indicated on the Drawings.
- B. Isolation valves for valve manifolds shall be as indicated on the Drawings.
- C. Remote Control Valves shall be as indicated on the Drawings.
 - 1. Each group of remote control valve shall be housed in a poly plastic valve box with locking lid and gravel base.
- D. Quick-coupling valves shall be as indicated on the Drawings.
- E. Manual drain valves shall be as indicated on the Drawings.

2.4 AUTOMATIC CONTROLLER

- A. The automatic controller shall be electrically-timed devices for automatically opening and closing remote control valves. All controllers and remote control valves supplied under this contract shall be of the same manufacturer and have similar operational and adjustment
- B. Controller shall be as indicated on the Drawings.
- C. Provide grounding and surge protection as recommended by the controller manufacturer. Refer to details on the Drawings.

2.5 IRRIGATION HEADS

- A. Irrigation heads shall be the model and type indicated on the Drawings.

2.6 CONTROL WIRING

- A. All splices shall be made with wire connectors, such as manufactured by 3M DBY or approved equal.
- B. Electric Control Wire shall be Polyethylene (PE) UF DIRECT BURIAL type. Wire which is routed from the Electric Remote Control valve to the controller shall be #14 AWG.

2.7 PVC SOLVENT CEMENT AND PRIMERS

- A. Solvent Cement shall be NSF approved and shall meet requirements of ASTM D 2564.
- B. Primer shall be NSF approved and shall be Weld-On, P-70 Industrial Polychemical Service or approved equal.

2.8 VALVE AND CONTROLLER BOXES

- A. Boxes for valves shall be heavy duty plastic Rain Bird, Carson-Brooks, complete with locking lids, or approved equal.
- B. Boxes and lids shall be tan color.

2.9 OTHER MATERIALS

- A. Other materials required or necessary shall be as shown and/or as required for best quality work.

PART 3 - EXECUTION

3.1 GENERAL

- A. Finish grading must be approved prior to installation of the irrigation system. Landscaping to be installed following irrigation system installation.
- B. All valves, fittings, heads, and piping shall be installed as indicated on the Drawings and all connections made to permit the irrigation system to function properly through its entire length.
- C. All materials and equipment shall be installed in strict accordance with manufacturer's written instructions and recommendations and all local and state codes, laws, ordinances, and regulations.
- D. Before proceeding with the installation of any section or unit of the irrigation system, the CONTRACTOR shall check and verify the correlation between ground measurements and Drawings and shall advise the OWNER of any discrepancies.
- E. The total number of irrigation heads and circuits and size of pipes shall be not less than shown unless otherwise approved. The stated maximum spacing for each type of irrigation head shall not be exceeded.

3.2 EXCAVATION

- A. Trenches shall be dug as wide and as deep as necessary to properly install the irrigation pipe.
- B. Pipe trenches shall be straight, or "snaked" slightly allowing for expansion and contraction of PVC pipe.
- C. Subsoil shall be kept separate from topsoil, where possible.

- D. Minimum cover depth shall be as follows:
 - 1. Supply pressure lines from water source to control valves: 18 inches unless otherwise indicated on the Drawings.
 - 2. Lateral lines from control valves to irrigation heads; 8 and 16 inches unless otherwise indicated on the Drawings. Lateral lines under paving, roadways, and driveways shall have 18 inches of cover and located in Schedule 40 PVC sleeves
 - 3. Trenches for control wire only shall be 18 inches deep unless otherwise indicated on the Drawings. Control wires under concrete walks and slabs, paving, roadways, and driveways shall be installed in Schedule 40 PVC sleeves.
- E. A trench of sufficient width shall be provided to allow for proper tamping around pipe.

3.3 PIPING-GENERAL

- A. Piping shall be laid out and installed in accordance with manufacturer's printed recommendations and industry standards. Substantial support shall be provided at all points, and pipes shall be snaked slightly allowing for expansion and contraction.
- B. Minimum 1-inch vertical clearance shall be between lines crossing at angles greater than 45 degrees.
- C. Minimum 3 inches horizontal and vertical clearances shall be between all other lines.
- D. All swing or swivel joints shall provide a leak-resistant joint with freedom of movement.
- E. Teflon thread sealant 3/4-inch wide (tape or liquid), or approved equal shall be used at all threaded joints.
- F. Galvanized steel pipes shall have clean standard threads of standard lengths. Joints shall be made up with pipe compound applied to male threads only and not more than 2 threads shall show at the joints when connected.
- G. Pipe sleeves shall be provided under all paving and where necessary for passage under finish surface material, future replacement, and for protection of PVC piping and control wire.

3.4 PLASTIC PIPE

- A. The pipe shall be guaranteed by the manufacturer to be suitable for operation under the conditions of this installation and shall be guaranteed free from defects in workmanship and quality.
- B. The pipe shall be connected by O-ring type or by solvent-weld joints as outlined below. Joints shall be made in strict accordance with the manufacturer's printed recommendation.
- C. The plastic pipe sections shall be placed accurately to line and grade in the prepared trenches. The inside of all pipe shall be clean and free from foreign matter and shall be end-reamed to remove burrs and provide full inside diameter of the pipe end.
- D. Pipe assembly shall have a firm, uniform bearing for the entire length of each pipeline to prevent uneven settlement. All adjustments to grade shall be made by scraping away or filling in with clean earth backfill material, well compacted under the body of the pipe.

Wedging of pipe will not be permitted. The inside of all pipes shall be clean and free from foreign materials before joints are assembled.

- E. Change of direction to pipe runs shall be done with fittings. Only gradual bends in pipe runs shall be accepted.
- F. Sealant tape shall be used on all threaded joints.
- G. All pipeline open ends upon which the WORK has been stopped shall be closed at the end of each day's construction work with a suitable temporary plug to prevent entrance of any foreign materials into the assembled pipeline.
- H. Pressure pipe shall be defined as all piping lying "upstream" from remote control valves and quick-coupling lines.

I. Joint Restraint System

- 1. All ductile iron pipe fittings and mainline gate valves shall be restrained by the joint restraint system. Fittings shall require a 'fitting to pipe restraint' and mainline gate valves shall require a 'valve to pipe' restraint. When required by manufacturer, gasket bell ends of pipe shall require a 'pipe to pipe' restraint.
- 2. **Concrete thrust blocks shall not be used.**
- 3. Joint restraints are needed on pipe sized 3" and larger, wherever the main pipe line:
 - a. Changes any direction at tees, angles, and crosses vertical and horizontal.
 - b. Changes size at reducers.
 - c. Stops at a dead-end.
 - d. Valves at which thrust develops when closed.
- 4. **The size and type of joint restraint system depends on a number of factors, including: pressure, pipe size, kind of soil, and type of fitting. Refer to detail table, as well as manufacturer's recommendations for proper sizing and types.**
- J. All pipes, lines, and risers shall be flushed thoroughly with water before installation of any heads. All debris and rocks found at that time shall be removed from the area as soon as possible.
- K. The areas noted on the details table shall be measured in a place perpendicular to the longitudinal axis of the pipe or to the longitudinal axis of the thrust developed. The thrust block bearing area shall be against undisturbed around.

3.5 VALVES

- A. Piping systems shall be supplied with valves at all points as indicated on the Drawings or specified herein so arranged to give complete regulating control throughout. Automatic control valves and gate valves shall be as detailed in the Contract Documents or as otherwise directed by the OWNER.
- B. Valves shall be the full size of the line in which they are installed, unless otherwise indicated on the Drawings.
- C. Remote control valves shall be adjusted so the most remote irrigation heads operate at the pressure recommended by the head manufacturer. Remote control valves shall be

adjusted so a uniform distribution of water is applied by the irrigation heads to the planting areas for each individual valve system. A union fitting shall be provided on the discharge side of the control valve. They shall be wired to operate in the order as shown. They shall be capable of being operated manually entirely independent of the controller.

- D. Isolation shall be installed as indicated on the Drawings.
- E. Manual Drain valves shall be shall be installed where indicated on the Drawings.
- F. Quick-coupling valves shall be provided, located, and installed as indicated on the Drawings.

3.6 VALVE BOXES

- A. All valve assemblies shall be installed as indicated on the Drawings.
- B. Install all Valve Boxes no closer than three feet from sidewalks, curbs, and all hard surfaced areas. Where three feet clearance from hardscape is not possible, locate the valve box as far as practical from areas of vehicle traffic. Do not install Valve Boxes at the low point of the landscaping.
- C. One valve per valve box unless approved by owner

3.7 IRRIGATION HEADS

- A. All nozzles shall be tightened after installation. All irrigation heads having an adjustment stem shall be adjusted on a lateral line for the proper radius diameter and/or flow
- B. All irrigation heads shall be set perpendicular to finished grades and at finish ground level.
- C. All irrigation heads shall be installed as detailed on the Drawings.
- D. The irrigation system shall be thoroughly flushed remove all possible foreign material prior to installation of the irrigation heads.
- E. The CONTRACTOR shall protect against re-entry of contaminated water into risers or piping. After flushing, the CONTRACTOR shall immediately install irrigation heads or cap risers until irrigation heads are installed.

3.8 CONTROLLER

- A. The CONTRACTOR shall install controller as indicated on the Drawings complete with required waterproof circuit breaker type disconnect switch, per manufacturer's printed recommendations.
- B. Controller location is essentially diagrammatic, and the actual installation shall be as specifically located by the OWNER.
- C. All local and applicable codes shall be followed in furnishing and/or connecting a 120-volt electrical service to the controller.

- D. The controller shall be mounted as indicated on the Drawings, in such a manner that all normal adjustments can be conveniently reached by the operator while in a standing position.
- E. The controller shall be grounded as indicated on the Drawings and as recommended by the manufacturer.
- F. Provide surge protection measures as recommended by the manufacturer.
- G. Adjustment of the controller shall be such that each control valve in the circuit will remain open for a readily adjustable period of 5 or less minutes to 60 minutes. Readily made field adjustments shall include a provision whereby any number of days in a week can be skipped and whereby one or more positions on the controller may be skipped. When any or all of the above adjustments have been made, the controller shall continue to operate automatically as set until further adjustments are made. Provision shall be made for conveniently resetting the start of the irrigation cycle at any time and also for advancing from one position to any other position at will..
- H. Timing, sequence and period will be supplied to the CONTRACTOR by the OWNER. At this time, the CONTRACTOR shall adjust the controller for normal operation.
- I. The controller shall be single-phase; 120-volt (approx.) ac operated and shall contain an "On-Off" switch and fuse assembly. The controllers shall be equipped with a transformer to reduce voltage to a 24-volt system. Controller station shall be provided as indicated on the Drawings.

3.9 WIRING AND ELECTRICAL WORK

- A. All electrical equipment and wiring shall comply with local and state codes and shall be installed by those skilled and licensed in the trade. Unless the governing codes specify otherwise, low voltage control wire may be installed by the CONTRACTOR when code allows.
- B. All 110-volt wire shall be installed in conduit and taken from appropriate sources as indicated on the Drawings. CONTRACTOR shall coordinate manufacturer and installer
- C. The CONTRACTOR shall provide low voltage, 24-volt direct burial wires. Wire size shall be as shown but shall be not less than No. 14. Where sizes are not shown, they shall be sized per wire manufacturer's sizing charts and specifications.
- D. The CONTRACTOR shall provide all wiring, conduits, sleeves, and connection for the low voltage electrical system between controller and valves, and where else shown and necessary for a complete and operable irrigation system.
- E. All splices shall be moisture proof using specified electrical connectors.
- F. An expansion curl should be provided within 3 ft of each wire connection and at pull box locations. Provide three feet of extra wire in each valve box.
- G. All conduits and sleeves necessary for running wires under concrete, walks, and paving shall be furnished and installed before said concrete, walks, and paving work is installed.

- H. Wire shall be continuous without splices except at control valves, and shall be routed in main line trench whenever possible.
- I. Install 2 extra wires (blue) to the last valve box in each run.
- J. Wiring color:
 - 1. Common: white
 - 2. Valve: red
 - 3. Spare: blue

3.10 PIPE TRENCH BACKFILL

- A. After pipe and wires have been installed and approved by the Owner's inspection, the trenches shall be backfilled. The backfill operation must provide a firm continuous support for the pipe.
- B. Backfill material shall be free of rocks and other materials that may damage the piping.
- C. Bottom of trenches shall be smooth and free of sharp rocks and other object that may damage pipe.
- D. The initial backfill shall be accomplished by carefully tamping selected material (from material excavated from the trench) under the pipe and between the pipe and the trench.
- E. The pipes shall be filled with water and pressurized during backfilling operations if necessary, to prevent drainage to piping.
- F. The backfill shall be carefully installed around and over the pipe to approximately 10 inches of the ground surface, then water shall be allowed to flow in the trench. After this puddling operation has been completed and allowed to stand for 24 hours, the balance of the materials shall be placed in the trench to the sub-grade line (leaving room for topsoil) Rocks and other materials found in the backfill shall be removed. The backfill shall be compacted carefully and thoroughly.
- G. Couplings and fittings shall be left exposed until leakage tests have been completed.
- H. Topsoil shall be installed prior to planting.
- I. Install detectable warning tape as indicated on the Drawings.

3.11 TESTING AND ADJUSTMENTS

- A. The OWNER shall be notified by the CONTRACTOR prior to performing hydrostatic tests on the irrigation system in place. This test shall be done by the CONTRACTOR in the presence of the OWNER. The test results will be acceptable to the OWNER when no leakage or loss of pressure is evident during the test period. Defects shall be detected and repaired prior to retesting.
- B. The irrigation heads shall be adjusted and balanced for optimum and uniform coverage without excessive fogging and overthrow on walks, paving, and structures. The height and elevations of risers and irrigation heads shall be adjusted.

- C. Following adjusting and balancing of the irrigation heads, an operating test of the entire system shall be performed by the CONTRACTOR in the presence of the OWNER at normal operating pressures. The test will be considered as acceptable if the system operates in a satisfactory manner providing uniform coverage of irrigated areas for a one week period of automatic operation with no leaks.

3.12 RECORD DRAWINGS

- A. Record Drawings shall be furnished to the OWNER at the time of the irrigation system inspection and before acceptance of the operating system by the OWNER.

3.13 ACCEPTANCE AND OPERATION BY OWNER

- A. Upon substantial completion of the work and acceptance by the Owner, the OWNER will issue a date of substantial completion letter to the contractor. Contractor shall be responsible for the training of the owner's maintenance staff 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 substantial completion.
- B.

END OF SECTION

**SECTION 32 9119
LANDSCAPE GRADING**

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Landscaping grading requirements.
- B. Backfill materials.

1.2 SUBMITTALS

- A. Submit maximum laboratory dry density and optimum laboratory moisture content for:
 - 1. Subgrade material, and
 - 2. Each type of fill to be used.
- B. Upon OWNER's request, submit a written quality control Inspections and testing report describing source and field quality control activities performed by CONTRACTOR and its Suppliers.

1.3 QUALITY ASSURANCE

- A. Do not change material sources, or aggregate without OWNER's knowledge.
- B. Reject backfill material that does not comply with requirements specified in this section.
- C. Landscape grading is aesthetic by nature and subject to continual monitoring and modification during the backfilling process. Work closely with OWNER particularly when grading and construction berms, channels, or other aesthetic considerations.

1.4 STORAGE

- A. Safely stockpile backfill materials.
- B. Separate differing materials, prevent mixing, and maintain optimum moisture content of backfill materials.
- C. Avoid displacement of and injury to project site/constructed areas while compacting or operating equipment.
- D. Movement of construction machinery over project site/constructed areas at any stage of construction is solely at CONTRACTOR's risk.

1.5 SITE CONDITIONS

- A. Do not place, spread, or roll any backfill material over material that is damaged by water. Remove and replace damaged material at no additional cost to OWNER.
- B. Control traffic and erosion. Keep area free of trash and debris. Repair settled, eroded, and rutted areas.
- C. Reshape and compact damaged structural section to required density.

1.6 ACCEPTANCE

- A. Native material may be wasted if there is no additional cost to substitute material acceptable to OWNER.
- B. For material acceptance refer to.
 - 1. Common fill, Section 31 20 00.

2. Crushed aggregate base, Section 31 20 00.
3. Cement treated fill, Section 31 20 00.

1.7 WARRANTY

- A. Any settlement noted in landscaped surfaces will be considered to be caused by improper compaction methods and shall be corrected at no cost to the OWNER.
- B. Restore incidentals damaged by settlement at no additional cost to OWNER.

PART 2 - PRODUCTS

2.1 BACKFILL MATERIALS

- A. Common fill, Section 31 2000.
- B. Crushed aggregate base, Section 31 1123.

2.2 ACCESSORIES

- A. Water: Make arrangements for sources of water during construction and make arrangements for delivery of water to site. Comply with local Laws and Regulations at no additional cost to OWNER when securing water from water utility company.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Identify required line, levels, contours, and datum.
- B. Stake and flag locations of underground utilities.
- C. Upon discovery of unknown utility or concealed conditions, notify OWNER.
- D. Verify stockpiled fill meets gradation requirements, areas to be backfilled are free of debris, snow, ice or water, and ground surface is not frozen.
- E. If subgrade is not readily compactable secure written authorization for extra excavation and backfill. Refer to Section 31 20 00.

3.2 PROTECTION

- A. Protect existing trees, shrubs, lawns, existing structures, fences, roads, sidewalks, paving, curb and gutter and other features.
- B. Protect above or below grade utilities. Contact utility companies to repair damage to utilities. Pay all cost of repairs.
- C. Protect Subgrade from desiccation, flooding and freezing.
- D. Do not fill adjacent to structures until Excavation is checked by OWNER.
- E. Do not use compaction equipment adjacent to walls or retaining walls that may cause wall to become over-stressed or moved from alignment.
- F. Do not disturb or damage foundation perimeter drainage, foundation, damp-proofing, foundation waterproofing and protective cover, or utilities in Trenches.
- G. Restore any damaged structure to its original strength and condition.

3.3 LAYOUT

- A. Maintain all benchmarks, control monuments and stakes, whether newly established by surveyor or previously existing. Protect from damage and dislocation.

- B. If discrepancy is found between Contract Documents and site, OWNER shall make such minor adjustments in the Work as necessary to accomplish the intent of Contract Documents without increasing the Cost of the Work to CONTRACTOR or OWNER.

3.4 GRADING

- A. Grading Intent: Spot elevations and contours indicated are based on the best available data. The intent is to maintain constant slopes between spot elevations. If a spot elevation is determined to be in error, or the difference in elevation between points change, then the minimum percentage of slope as a result of field adjustment of specific spot elevations is as follows:
 - 1. Pavement Areas: 1 percent.
 - 2. Concrete or Brick Areas: 0.30 percent.
 - 3. Lawn or Planted Area: 0.75 percent.
- B. Conduct Work in an orderly manner. Do not create a nuisance. Do not permit soil accumulation on streets or sidewalks. Do not allow soil to be washed into sewers and storm drains.
- C. Grade slopes to provide adequate drainage after compaction. Do not create water pockets or ridges. Use all means necessary to prevent erosion of freshly graded areas during construction until surfaces have been constructed and landscaping areas have taken hold.
- D. Remove surface stones greater than 1 inch from finished grading.
- E. In planting areas, provide a finished grade that conforms to Section 32 9300.

3.8 SURFACE RESTORATION

- A. Finish landscaped areas as indicated on drawings.
 - 1. Backfill areas to contours and elevations indicated. Do not use frozen materials.
 - 2. Make smooth changes in grade. Blend slopes into level areas.
 - 3. Remove surplus backfill materials from site.
 - 4. Leave stockpile areas completely free of excess fill materials.
 - 5. Slope grade away from building at a minimum of 3 inches in 10 feet unless specified otherwise.

3.9 CLEANING

- A. Remove stockpiles from the site. Grade site surface to prevent free standing surface water.
- B. Leave borrow areas clean and neat.

END OF SECTION

SECTION 32 92 00
TURF AND GRASSES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sodding

1.2 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.
- 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 City can occupy or use the Work for its intended purpose.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For landscape Installer.
- B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, 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 seed mixture for turfgrass sod. Include identification of source and 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.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Recommended procedures to be established by City for maintenance of turf during a calendar year. Submit before expiration of required maintenance periods.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf 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. Experience: Three years' experience in turf installation.
 - 3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 - 4. 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.
 - 5. Pesticide Applicator: State licensed, commercial.

1.6 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. Sod: Harvest, deliver, store, and handle sod according to requirements in "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.
- 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.

1.7 FIELD CONDITIONS

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial establishment periods to provide required maintenance from date of planting completion.
 - 1. Spring Planting: 15 March.
 - 2. Fall Planting: 15 October.
 - 3. Days considered for the establishment period must be conducive to the growth and establishment of the sod and not non-growing seasonal months.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be

obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 TURFGRASS SOD

- A. Turfgrass Sod: The sod supplied by the Contractor shall be grown by a sod grower, well established, pest and weed free, one (1) and one quarter (1-1/4") inches thick, and supplied in rolls or sheets of the industry size. Sod shall be the current year's crop, guaranteed by the supplier as follows:
 - 1. Bioplay, by BioGrass Sod Farms (801-562-9090).
 - 2. Or approved equal
- B. Turfgrass Sod: 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." Furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted.
- C. Turfgrass Species: Bluegrass Sod
 - 1. Sod specifications include but are not limited to:
 - a. Shall be grown from a 10 seed blend utilizing at least 6 highly-rhizomatous cultivars that exceed normally accepted industry criterion. Shall be rated highly wear-tolerant, have strong living color, be disease resistant, with strong leaf texture and early spring and late fall green color.
 - b. Shall contain no rye grass cultivars.
 - c. Shall have a maximum 50# per acre seeding rate.
 - d. Shall have a minimum one year root base with strong rhizome development.
 - e. Shall be certified noxious weed free.
 - f. Shall be Water Wise Turf™ as grown by a Water Wise Certified™ grower.
 - 1) Shall require no more than 30" annual supplemental water during establishment and no more than 20" annual supplemental water after establishment.
 - 2) Shall contain a strong root base capable of root penetration to a minimum depth of 8" into landscape soil.
 - g. Growing medium shall be a sandy soil (75% sand, 17% silt, 8% clay) with low clay content.
 - h. Shall be grown without netting.
 - i. Shipping mow height shall be 1-1/2".

2.2 FERTILIZERS

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 - 1. Fertilizer shall be a complete mixture, analyzing sixteen (16)% Nitrogen; sixteen (16)% Phosphoric Acid; and eight (8)% Pot Ash, of commercial type and applied at a rate of six (6) pounds per thousand (1000) square feet of area.

- B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 - 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
 - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.3 SOIL AMENDMENTS

- A. Soil amendment shall be dairy based organic compost material. Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content of 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 5 to 10 dS/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
 - 1. Organic Matter Content: 35-50 percent of dry weight.
 - 2. Sod lawn areas apply at a rate recommended by Soils Report.
 - 3. Seed areas apply at a rate recommended by Soils Report.
 - 4. Rototill compost with native soil and mix thoroughly to a minimum depth of six (6") inches.

2.4 PESTICIDES

- 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 Project Manager and replace with new planting soil.

3.2 PREPARATION

- A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
 - 1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
 - 2. Protect grade stakes set by others until directed to remove them.
- B. 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.

3.3 TURF AREA PREPARATION

- A. Irrigation system must be fully operational before commencement of planting operations.
- B. All areas of fill, i.e., trenches, mounds, etc., shall be compacted and settled as specified in the Grading and excavation of sprinkler irrigation sections of this project before any topsoil is placed on areas to be sodded.
- C. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
- D. Before topsoil is spread, the sub-grade shall be scarified to a depth of four (4) inches to ensure proper bonding with applied topsoil if it has been compacted due to weather or equipment. The area shall be leveled, weeded and raked free of stones larger than one half (1/2") inch in diameter and other debris.
- E. Topsoil shall be spread to a depth of four (4) inches or as directed by the Project Manager.
- F. Any existing topsoil used in sodded areas shall be loosened and pulverized to a depth of four (4) inches and all stones over one (1) inch in any dimension, sticks, roots, rubbish, or other extraneous matter, shall be removed from the premises. The surface will be fine graded so that when settled, the surface is free from depressions or ridges and will conform to the required grades indicated. The surface shall be smooth, loose, and of uniformly fine texture at the time of installation.
- G. Any areas containing new topsoil shall be rolled by a hand roller on small areas. 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. Large areas shall be final graded by passing a land plane in three different directions over the entire area to be planted.
- H. New turf shall be installed so that the finished grade shall be one-half (1/2) inch below the top of adjacent paving or meeting exactly the grade of existing lawn.
- I. The Contractor shall prepare no more ground than can be sodded in a twenty-four (24) hour period. Sod shall be placed within 24 hours of ground preparation. The ground shall be re-prepared if weather or traffic has compromised the friability of the prepared area.
- J. 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.
- K. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

- L. The specified fertilizer shall be applied and incorporated into the upper four (4) inches of topsoil at a rate of six (6) pounds per thousand (1000) square feet.
- M. Before planting, obtain Project Manager's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 SOD AVAILABILITY AND CONDITION

- A. The Contractor shall satisfy himself as to the existing conditions prior to any construction. The Contractor shall be fully responsible to furnish and lay all sod required on the plans. He shall furnish new sod as specified above and lay it so as to completely satisfy the intent and meaning of the plans and specifications at no extra cost to the City.
- B. In the case of any discrepancy in amount of sod to be removed or amount to be used, it shall be the contractor's responsibility to report such to the Project Manager prior to commencing the work.
- C. Any condition of the sod that shall prevent it from being lifted shall also be reported to the Project Managers. This shall not relieve the Contractor of the responsibility of removing the sod necessary to complete the project.

3.5 SODDING

- A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy. No sod shall be stored on the site for longer than two (2) days. Sod that becomes yellow, dry, or broken, shall be removed from the site by the Contractor at his expense.
- B. 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. No partial strip or pieces will be accepted. Avoid damage to soil or sod during installation. Tamp and roll lightly to ensure contact with soil, 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.
 - 1. All work shall be done from boards laid on top of the prepared surface or on already laid sod. Care shall be taken to prevent foot prints or other disturbances to the prepared bed, other than absolutely necessary. Any such disturbances shall be promptly repaired so that the sod will be laid on a proper bed to insure the necessary bonding between it and the sod.
 - 2. Lay sod across slopes exceeding 1:3.
 - 3. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer but not less than two anchors per sod strip to prevent slippage.
- C. Saturate sod with fine water spray within two hours of planting. See table below for recommended watering amounts for the first month after installation:

Week	1 st	2 nd	3 rd	4 th
How often to water	Every Day	Every Other Day	Every Third Day	Every Fourth Day
April	*			

May	*	1/3	1/2	2/3
June	1/4	1/2	2/3	3/4
July	1/4	1/2	2/3	3/4
August	1/4	1/2	3/4	1
September	*	1/3	1/2	2/3
October	*			
	*Apply 1/4 of an inch as needed			

3.6 SOD LIFTING

- A. All sod shall be removed from areas of construction (i.e., where walks, concrete slabs, buildings, etc., will be built) prior to excavation and other operations or when sod lifting is specified.
- B. Prior to beginning to lift any large quantities of sod, the Contractor shall notify the Project Manager in sufficient time for notification of the Park Maintenance Personnel, so that they can schedule the removal of the sod from the site to lay at another park site.
- C. When the sod is to be used by the Park Maintenance Personnel, as specified on the plans, the sod pieces shall be cut by a mechanical sod cutter into uniform pieces with square comers. Individual pieces shall not exceed sixteen (16) inches wide and forty-eight (48) inches long or the current standards size of the sodding industry. All sod shall be cut to a thickness of no more than one and one-quarter (1-1/4) inches, but no less than the sodding industry standards.

3.7 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.

3.8 TURF ESTABLISHMENT

- 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 seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
 2. Water turf with fine spray 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.
 - 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 3.13. 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. Seeded Turf: 60 days from date of planting completion.
 - 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.
 2. Sodded Turf: 30 days from date of planting completion.

3.9 ACCEPTABLE TURF ESTABLISHMENT

- A. The Contractor shall be responsible for all sodded and seeded areas during the Turf Establishment period. The Establishment Period shall begin at the time sodding or seeding 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 Seeded Turf: Turf Establishment shall be achieved when the turf is a healthy, uniform, close stand of grass, free of weeds and surface irregularities, with coverage exceeding 95 percent over any 10 square foot area and bare spots not exceeding 4 by 4 inches.
 2. 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.
- 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.

3.10 PESTICIDE APPLICATION

- A. Apply pesticides and other chemical products and biological control agents according to requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with City'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.

3.11 CLEANUP AND PROTECTION

- 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 City'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.

END OF SECTION

**SECTION 32 9300
LANDSCAPE PLANTING**

PART 1 - GENERAL

1.1 THE REQUIREMENT

- A. The CONTRACTOR shall perform all the landscaping and all appurtenant work, complete, in accordance with the requirements of the Contract Documents.
- B. **Scope of Work:** Landscaping as referred to herein shall include, but not be limited to the following work: soil preparation, weed control, finish grading, furnishing and installing plant materials, tree staking and tying, cleanup, maintenance, and guarantee.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Federal Specifications:
 - 1. FS O-F-241 D Fertilizer, Mixed, Commercial
- B. Commercial Standards:
 - 1. ANSI/ASTM D 422 Method for Particle-Size Analysis of Soils
 - 2. ANSI Z601 Nursery Stock
 - 3. American Association of Rules and Grading Provisions Nurserymen, Inc.

1.3 CONTRACTOR SUBMITTALS

- A. **General:** The CONTRACTOR shall furnish a certificate with each delivery or bulk material delivery, stating source, quantity, and type of material. All materials shall conform to specification requirements. All certificates shall be delivered to the OWNER at time of each delivery. All bulk delivered materials shall be delivered with level load volume plainly marked on the truck bed.
- B. Submittals required:
 - 1. Existing Topsoil Analysis Report (including amendment recommendations) or Imported Topsoil Analysis Report
 - 2. Literature on Fertilizers and additives
 - 3. Bark Mulch
 - 4. Rock Mulch
 - 5. Weed Barrier Fabric
 - 6. Literature on staking materials

1.4 QUALITY ASSURANCE

- A. **General:** All plants furnished by the CONTRACTOR shall be true to type or name as shown in the Contract Documents and shall be tagged in accordance with the standard practice recommended by the Agricultural Code of the State of Utah; however, determination of plant species or variety will be made by the OWNER.
- B. All plants shall comply with Federal and State laws requiring inspection for plant diseases and infestations. Inspection certificates required by law shall accompany each shipment of plants, and certificates shall be delivered to the OWNER.

- C. All inspections herein specified will be made by the OWNER or its representative. The CONTRACTOR shall request inspection at least 24 hours in advance of the time inspection is required. Inspection will be required on the following stages of the WORK:
 - 1. During preliminary grading, soil preparation, and initial weeding.
 - 2. When trees are spotted for planting, but before planting holes have been excavated.
 - 3. When finish grading has been completed.
 - 4. When all specified work, except the maintenance period has been completed.
 - 5. Final inspection at the completion of the maintenance period.
- D. Plants shall be subject to inspection and approval or rejection by the OWNER at place of growth and upon delivery to the site at any time before or during progress of the WORK and according to:
 - 1. Quantity, quality, size, and variety;
 - 2. Ball and root condition; and
 - 3. Latent defects and injuries resulting from handling, disease, and insects.
- E. Plants approved at pre-planting inspection shall still be subject to rejection during planting if found to be below Specifications.
- F. Rejected plants shall be identified in an obvious manner, promptly removed from the site and replaced with acceptable equals.
- G. Plants shall have been grown in nurseries which have been inspected by the governing authorities. Inspection of plant materials required by City, County, State, or Federal authorities shall be the responsibility of the CONTRACTOR, who shall have secured permits or certificates prior to delivery of plants to site.

1.5 CLEANUP

- A. Upon completion of all planting operations, the portion of the project site used for a work or storage area by the CONTRACTOR shall be cleaned of all debris, superfluous materials, and equipment. All such materials and equipment shall be entirely removed from the project site as specified in Division 01 Section "Project Closeout".
- B. All walks or pavement shall be swept or washed clean upon completion of the work of this Section.
- C. During the entire Contract period, plant containers that have been cut or removed from plant materials shall be removed from the project site daily, in accordance with the provisions for maintenance and guarantee as specified in Division 01 Section "Project Closeout".

1.6 MAINTENANCE OF LANDSCAPE PLANTING PRIOR TO ACCEPTANCE OF PROJECT

- A. **General:** The CONTRACTOR shall be responsible for protecting, watering, and maintaining all planting and irrigation systems until final acceptance of all work under the contract.
- B. At time of acceptance of the complete project, the lawn shall be totally established with no bare spots, mowed a minimum of 2 times, and the grass shall be at least 1-1/4 to 2 inches in height.

- C. **Watering:** Trees and shrubs shall be thoroughly soaked after planting and provided with additional water at intervals as necessary to provide for good health and growth of the planting.
- D. **Upon completion** of lawn sodding, the entire area shall be soaked to saturation by a fine spray. The new planting shall be kept watered by the irrigation system existing on the site during dry weather or whenever necessary for proper establishment of the lawn. Care shall be taken to avoid excessive washing or puddling on the surface and any such damage caused thereby shall be repaired by the CONTRACTOR at its own expense.
- E. **Protection:** The CONTRACTOR shall provide adequate protection to all newly planted areas including the installation of approved temporary fences to prevent trespassing and damage, as well as erosion control, until acceptance.
- F. The CONTRACTOR shall replace any materials or equipment it has damaged or which has been damaged by its employees or subcontractors.
- G. Partial utilization of the project shall not relieve the CONTRACTOR of any of the requirements contained in the Contract Documents.
- H. **Mowing of Lawn Areas:** First mowing of lawn areas shall begin as soon as the grass has reached a height of 3 inches and subsequent mowing shall be at least once a week, or as often as necessary to maintain all lawn areas at a uniform height of 1-1/2 to 2 inches.
- I. All lawns shall be fertilized every 3 weeks with 6 lb of 16-8-8 commercial fertilizer per 1000 sq ft for the first 7 weeks and fertilized thereafter once each 5 months prior to acceptance.
- J. Plants shall be maintained in a vigorous, thriving condition by watering, cultivating, weeding, pruning, leaf removal, spraying, and other operations necessary. No trees or shrubs will be accepted unless they are healthy and show satisfactory foliage conditions.
- K. All planted areas shall be cultivated at least every 2 weeks and raked smooth, to present a neat appearance and additional mulch shall be added where necessary.
- L. Maintenance shall include, in addition to the foregoing, cleaning, edging, repairs to stakes, wire, and wrappings, the repair of erosion, and all other necessary work of maintenance. Sidewalks and other paved areas shall be kept clean while planting and maintenance are in progress.
- M. Any and all irrigation lines broken or disrupted during this construction shall be replaced to proper working order prior to contract work and be acceptable to the OWNER.

1.7 FINAL INSPECTION AND GUARANTEE

- A. Inspection of work of lawns and planting will be made at conclusion of maintenance.
- B. Written notice requesting inspection shall be submitted to the OWNER at least 10 days prior to the anticipated inspection date.
- C. Final acceptance of the WORK prior to guarantee period of the contract will be accepted upon written approval by the OWNER, on the satisfactory completion of all work, including maintenance, but exclusive of the replacement of plant material.

- D. Any delay in the completion of any item of work in the planting operation which extends the planting into more than one season shall extend the guarantee in accordance with the date of completion given above.
- E. The CONTRACTOR shall replace, as soon as weather conditions permit, all dead plants and all plants not in a vigorous, thriving condition which are noted at the end of the one year guarantee period.
- F. Plants used for replacement shall be of the same size and variety specified in the plant list. Plants shall be furnished, planted, staked, and mulched as specified.
- G. All work done under this contract shall be left in good order to the satisfaction of the OWNER and the CONTRACTOR shall, without additional expense to the OWNER, replace any trees, shrubs, etc., which develop defects or die during the one-year guarantee period.

1.8 GUARANTEE FOLLOWING ACCEPTANCE OF PROJECT

- A. General: The CONTRACTOR shall be responsible for a period of one year after date of acceptance of all work under the Contract, for all necessary plant or tree replacements. The CONTRACTOR shall provide a written guarantee to the OWNER from the landscaping subcontractor, embodying the provisions of this Section of the Specifications.
- B. The WORK covered by the guarantee portions of these specifications consists of providing all replacements of plants, labor, materials, equipment, and supplies and in performing all operations in connection with guarantees.
- C. The CONTRACTOR shall clean-up and remove unused or waste materials from the site and leave the area in a neat condition (satisfactory to the OWNER) whenever it performs work during the guarantee Period.
- D. **Final Inspection:** The OWNER and CONTRACTOR shall make a final inspection at the end of the one-year guarantee period. Any plants and materials found defective at time of final inspection shall be replaced within a time agreed upon by both parties. If it is too late in the planting season for replanting, the replacements shall be made during the next planting season even though such planting may run beyond the maintenance and correction period.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All landscaping materials for soil conditioning, weed abatement, or planting shall be first-grade, commercial quality and shall have certificates indicating the source of material, analysis, quantity, or weight attached to each sack or container or provided with each delivery. Delivery certificates shall be given to the OWNER as each shipment of material is delivered. A list of the materials used, together with typical certificates of each material, shall be submitted to the OWNER prior to the final acceptance of the job.

2.2 TERMINOLOGY AND QUALIFICATIONS

- A. Plants or plant material having characteristics not conforming to terms as defined will not be accepted. The terms "plant material" or "plants" refer to all vegetation, whether trees, shrubs, ground cover, or herbaceous vegetation.
- B. Quality refers to structure and form, as evidenced by density and number of canes and branches, compactness, symmetry, and general development without consideration of size or condition. Standard quality indicates the least acceptable quality. Plants shall be typical of the species and variety of good average uniform growth, shall be well formed and uniformly branched, and shall have the minimum number of canes specified, free from irregularities, or shall conform to minimum quality index. Where the number of canes is not specifically stated in describing this grade, the standards of the "Horticultural Standards" as adopted by the American Association of Nurserymen, shall apply. In this case, the number of canes and other factors for the appropriate classification under "quality definition" in the Horticultural Standards shall be the Quality index. Plant material below this standard will be considered "culls" and are not acceptable. Plants shall be nursery grown.
- C. Specimen means an exceptionally heavy, symmetrical, tightly-knit plant, so trained or favored in its development and appearance as to be outstanding, superior in form, number of branches, compactness, and symmetry.
- D. Size is the factor controlled by dimensions representing height or spread, or both, without consideration of quality or conditions. For standard quality, a dimension is given for height or container size, or a dimension is given for height as well as container size.
- E. Height is usually indicated with a tolerance. The smaller dimension is the minimum acceptable. The larger dimension represents the maximum permissible. The average dimension of all plants must equal the average of the tolerance figures shown on each item
- F. Condition is the factor controlled by vitality and ability to survive and thrive and be comparable with normal plants of the same species and variety in the vicinity, at the same season of the year. In addition, plants shall be free from physical damage or adverse conditions that would prevent thriving. Conditions also sometimes refer to state of growth, i.e., whether "dormant condition" or "growing condition" and this state shall be comparable to plants of similar species in the vicinity or leaves, formation of buds, and the like.
- G. Cane means a primary stem which starts from the ground, or close to the ground, at a point not higher than 1/4 the height of the plant.
- H. Caliper shall be taken 12 inches above the finish grade or ground, as a guide, or where a dimension in trunk appears to form the head of the tree.
- I. Foliage line is maximum dimension in case of specimen plants. It measures from ground to lowest part of body of plant.
- J. Collected plants shall not be used.

2.3 TOPSOIL

- A. Existing topsoil may be used if it meets the same requirements for topsoil listed below or amendments are added to meet the same requirements for topsoil listed below.

- B. Topsoil shall meet all specifications below for either "Ideal" or "Acceptable" categories. Soil that falls within the "Not-Acceptable" range shall not be used.

TOPSOIL QUALITY*

Category	pH	Soluble Salts dS/m or	Sodium Absorption Ratio (SAR)	Organic Matter %	Sand %	Silt %	Clay %	Texture Class
Ideal	5.5- 7.5	<2	<3	≥2.0	<70	<70	<30	Loam (L), Silt Loam (SiL)
Acceptable	5.0- 8.2	<4	3 to 7 SiL, SiCL, CL 3 to 10 SCL, SL, L	≥1.0	<70	<70	<30	Sandy Clay Loam (SCL) Sandy Loam (SL) Clay Loam (CL) Silty Clay Loam (SiCL)
Not-Acceptable	<5.0 >8.2	>4	>10	<1.0	≥70	≥70	≥30	Loamy Sand (LS) Sandy Clay (SC) Silty Clay (SiC) Sand (S), Silt (S), Clay (C)

COARSE FRAGMENTS*

Category	%>2 mm (>5.0% exceeds guidelines)	Rocks Present >1.5" (>1.5" exceeds guidelines)
Ideal	≤2.0	—
Acceptable	2.1-5.0	—
Not-Acceptable	>5.0	—

TOPSOIL NUTRIENT SPECIFICATION*

	Nitrate Nitrogen ppm	Phosphorus ppm	Potassium ppm	Iron ppm
Ideal / Acceptable	>20	>15	>150	>10

*from "Topsoil Quality Guidelines for Landscaping", June 2002, AG/SO-02, prepared by Rich Koenig, Utah State University Cooperative Extension Soil Specialist, and Von Isaman, QA Consulting and Testing, LLC.

- C. **Mechanical Analysis** shall be performed and shall conform to ANSI/ASTM D 422.

2.4 FERTILIZER AND ADDITIVES

- A. Fertilizer and additives shall be determined by the Topsoil Analysis and based on section 2.3.
- B. Fertilizer shall be furnished in bags or other standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon.
- C. Chemical fertilizers shall be a mixed commercial fertilizer conforming to FS O-F-241 D, Type I, with percentages of nitrogen, phosphoric acid, and potash at 5-10-5 and 16-16-8. The combined N-P-K content shall be following percentages of total weight: 5 percent nitrogen 10 percent phosphoric acid and 5 percent potash. Fertilizers shall be uniform in composition, dry, and free flowing.
- D. Tablets shall be 21 grams each 20-10-5 Agriform, Lesslie, or approved equal.

2.5 MULCH

- A. Bark Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:
1. Type: Shredded wood and bark chips.
 2. Size Range: 3 inches maximum, 1/2 inch minimum.
 3. Color: Natural.
- B. Rock Mulch 1" minus crushed rock - tan.

2.6 WEED BARRIER FABRIC

- A. Weed barrier fabric shall be one of the following:
1. "Dewitt Weed Barrier Pro 5
 2. or approved equal.

2.7 PLANT MATERIALS

- A. Plants shall meet requirements of the Contract Documents and shall be in accordance with the botanical names and applicable standards of quality, size, condition, and type.

They shall be true to name, genera, species, and variety in accordance with reference publications.

- B. Plant names are defined in "Standardized Plant Names" and "Bailey's Encyclopedia of Horticulture." When a name is not found in either reference, the accepted name used in the nursery trade shall apply.
- C. Plants shall be marked for identification. Each bundle of plants and at least 25 percent of each species and variety of separate plants in any one shipment shall have legible labels securely attached before delivery to the site.
- D. All trees and shrubs shall be measured while their branches are in their normal position. Height and spread dimensions specified refer to the main body of the plant and not from branch or root tip to tip. No trees will be accepted with their leaders cut, or so damaged that cutting is necessary.
- E. All plants shall be symmetrical and shall conform to the size, age, and condition as specified on the plant list shown in the Contract Documents. Exceptions are as follows:
 - 1. Plants larger than specified in the plant list may be used if approved by the OWNER, but use of such plants shall not increase the contract price. If the use of larger plants is approved, the spread of roots or ball earth shall be increased in proportion to the size of the plant. Bare root plants furnished in size greater than specified shall be balled and burlaped when required by the OWNER
 - 2. Where caliper or other dimensions of any plant materials are omitted from the Plant List, it shall be understood that such plant materials shall be normal stock for type
- F. Plants shall be of sound health, vigorous, and free from plant disease and shall be well-branched, shall have full foliage when in leaf, and shall have a healthy well-developed normal root system. Cold storage plants will not be accepted. Plants that are sensitive to shock from elevation change shall be grown at elevations close enough to site to alleviate any plant damage due to such change for at least 2 years.
- G. Bare rooted (BR) plants shall have well-developed branch systems and vigorous root systems. They shall be dug to sufficient depth to insure full recovery and development of the plants. Roots of these plants shall be covered with a uniformly thick coating of mud being puddled immediately after they are dug
- H. Balled and burlaped (BB) plants shall have firm, natural balls of earth, or diameter not less than that specified and of sufficient depth to include all the fibrous and feeding roots. No plant moved with a ball will be accepted if the ball is cracked or broken before or during plant operations, except on special approval of the OWNER
- I. Roots or balls of all plants shall be adequately protected at all times from sun and drying winds.
- J. Plants (indicated to be in marked cans, pots, or other containers on the plant list) shall have been grown in the containers for a minimum of 6 months and a maximum of 2 years. Roots shall fill the containers but show no evidence of being or having been root bound.
- K. Trees shall have straight trunks and all old abrasions and cuts shall be completely callused over. In no case shall trees be topped before delivery.
- L. Plants shall have been transplanted or root-pruned at least once in the 2 years. Plants shall not be pruned prior to delivery except as authorized by the OWNER.

2.8 STAKING MATERIALS

- A. Staking System: As indicated on Drawings
- B. Guying System: As indicated on Drawings.
- C. Flags: Standard surveyor's plastic flagging tape, white, 8 inches long.

PART 3 - EXECUTION

3.1 GENERAL

- A. Irrigation system must be fully operational before commencement of planting operations.
- B. The landscape work shall not be performed at any time when it may be subject to damage by climatic conditions.
- C. The CONTRACTOR shall verify all dimensions in the Contract Documents. Dimensions and plant locations shown shall be coordinated with OWNER and final location shall be site-oriented by the planter and OWNER. Any discrepancies or inconsistencies discovered shall be brought to the attention of the OWNER.
- D. In case of conflict between the plant list totals and total plant count of the Contract Documents, the CONTRACTOR shall provide the higher number of plants.
- E. Delivery of materials may begin only after samples and tests have been approved by the OWNER. All materials furnished for the work shall be not less than the approved sample.
- F. Substitutions for the indicated plant materials may be permitted pursuant to the Contract Documents.
- G. The CONTRACTOR shall provide temporary fencing, barricades, covering, or other protections to preserve existing landscaping items indicated to remain and to protect the adjacent properties and other structures when they may be damaged by the landscape work. As indicated on Drawings.
- H. Waste materials shall be removed and disposed of off the OWNER's property, unless otherwise indicated.
- I. It shall be the responsibility of the CONTRACTOR to avail itself of any information regarding utilities which are in the area of work and to prevent damage to the same. The CONTRACTOR shall provide protection to the utilities as necessary.
- J. Burning of combustible materials on the site shall not be permitted.
- K. The CONTRACTOR shall provide protection to structures, sidewalks, pavements, and other facilities in areas of work which are subject to damage during landscape work. Open excavations shall be provided with barricades and warning lights which conform to the requirements of governing authorities and the State's OSHA safety requirements from dusk to dawn each day and when needed for safety.
- L. Planting areas include all areas to be landscaped unless, specified or shown, otherwise.

3.2 SOIL PREPARATION

- A. The landscape work shall not begin until all other trades have repaired all areas of settlement, erosion, rutting, etc., and the soils have been re-established, re-compacted, and refinished to finish grades. The OWNER shall be notified of all areas which prevent the landscape work from being executed.
- B. Areas requiring grading by the landscaper including adjacent transition areas shall be uniformly level or sloping between finish elevations to within 0.10-ft above or below required finish elevations.
- C. The landscape work shall not proceed until after walks, curbs, pavings, edging, and irrigation systems are in place. The contract operations shall be completed to a point where the landscape areas will not be disturbed. The subgrade shall be cleaned free of waste materials of all kinds.
- D. During grading waste materials in the planting areas such as weeds, rocks (1 inches and larger) building materials, rubble, wires, cans, glass, lumber, sticks, etc., shall be removed from the site. Weeds shall be dug out by the roots.
- E. Fertilizers, additives, peat, etc. subject to moisture damage shall be kept in a weatherproof storage place in such a manner that they will be kept dry.
- F. Finish subgrade and topsoil placement and grading shall consist of:
 - 1. Prepare subgrade by rough grading and removing all irregularities and debris. Dig subgrade down as required in shrub beds and turf areas for the placement of topsoil. Provide laser leveling on large flat areas to create a uniform level subgrade.
 - 2. Planting areas shall have all road base and other debris removed prior to placement of topsoil. Subgrade soil shall be in a loosened and rough surface finish before topsoil is placed over subgrade. (Sub-grade surface shall not be smooth, but a rough surface shall exist for a transition zone of topsoil to subsoil.) If areas of subgrade become compacted before topsoil is placed, subgrade shall be tilled again before topsoil placement.
 - 3. Adding amendments (compost, & fertilizers as recommended by topsoil report) and thoroughly mixing amendments by mechanical means to produce evenly mixed amended topsoil prior to placement topsoil.
 - 4. Till lawn and planting area subsoil's and topsoil's that are compacted.
 - 5. After tilling or placement of topsoil, bring areas to uniform grades by floating and/or hand raking. In large open level areas, perform laser leveling to create uniform level areas.
 - 6. Make minor adjustment of finish grades as directed by the project manager.
 - 7. Remove waste materials over 1" in size such as stones, roots, or other undesirable foreign materials and finish raking, dishing, dragging, and smoothing soil ready for planting.
 - 8. No grading or soil placement shall be undertaken when soils are wet or frozen
- G. Any unusual subsoil condition that will require special treatment shall be reported to the OWNER
- H. Topsoil shall be uniformly distributed over all areas where required.
- I. Surface drainage shall be provided as shown by molding the surfaces to facilitate the natural run-off of water. Low spots and pockets shall be filled with topsoil and graded to drain properly.

- J. Finish grade for sodded areas shall be 2 inches below finish grade of adjacent pavement. Finish grade (top of bark mulch) shrub bed areas shall be 1 inches below finish grades of adjacent pavement.

3.3 DELIVERY, STORAGE, AND HANDLING OF PLANT MATERIALS

- A. No plants other than the required samples shall be dug or delivered to the site until the required inspections have been made and the plant samples are approved
- B. Plants shall not be pruned prior to delivery except upon approval by the OWNER.
- C. Plant material shall be planted on the day of delivery if possible. The CONTRACTOR shall protect the stock in a temporary nursery at the project site where it shall be protected from sun and drying winds and shall be shaded, kept moist, and protected with damp soil, moss, or other acceptable material. Plants shall be planted within 2 days after delivery.
- D. All balled and burlapped plants which cannot be planted immediately in delivery shall be set on the ground and shall be well protected with soil, wet moss, or other acceptable material. Bare rooted plants, which cannot be planted immediately, shall be planted on heeled-in trenches immediately upon delivery. No material heeled-in more than one week may be used. Bundles of plants shall be opened and the plants separated before the roots are covered. Care shall be taken to prevent air pockets among the roots.
- E. During planting operations, bare roots shall be covered with canvas, wet straw, or other suitable materials. No plants shall be bound with wire or rope at any time so as to damage the bark or break branches.
- F. Plants shall not be picked up or moved by stem or branches, but shall be lifted the ball or container.
- G. Plants shall be lifted and handled from the bottom of the ball or container. Plants with balls cracked or broken before or during planting operations will not be accepted and shall be immediately removed from the site.

3.4 TREE AND PLANT LOCATIONS

- A. The CONTRACTOR shall locate and stake all tree and shrub locations and have the locations approved by the OWNER before starting excavation for same. The plant locations shall be observed, and their locations shall be adjusted as directed by OWNER before final approval.
- B. No trees shall be located closer than 72 inches to structures unless otherwise shown. Ground covers and shrubs may be planted up to structures or curbs.

3.5 PLANT PITS

- A. Plant pits, centered on location stakes, shall be excavated circular pits with vertical sides and flat or saucer shape bottom in accordance with the following sizes unless shown
 - 1. Tree pits shall be at least 3 times greater in diameter than the specific diameter of ball or spread of roots, and at depth of ball or roots.
 - 2. Tree pits shall include drainage sump as indicated on the drawings.
 - 3. Shrubs shall be planted in pits or holes of soil the depth of ball below finished grade, or as much deeper as necessary to properly set the plant at finished grade.

3.6 PREPARED BACKFILL

- A. Tree and shrub pit backfilling soil shall consist of topsoil.
- B. Tree and shrub pits shall be provided with fertilizer tablets as follows:
 - 1. 1 per one-gallon can plant
 - 2. 3 per 5-gallon can plant
 - 3. 4 per trees

3.7 ROCKS OR UNDERGROUND OBSTRUCTIONS

- A. In the event that rock or underground obstructions are encountered in the excavation of plant pits, alternative locations shall be selected by the OWNER. Moving of trees to alternative locations shall not entail additional costs to the OWNER.

3.8 SETTING PLANT MATERIALS

- A. The soil shall not be worked when the moisture content is so great that excessive compaction will occur, nor when it is so dry that a dust will form in the air or that clods will not break readily. Water shall be applied if necessary to provide ideal moisture for filling and for planting as herein specified.
- B. Plants shall be set in center of pits as shown in the Contract Documents. They shall be set plumb and straight, and at such a level that after settlement that the crown of the plant will be 1 to 2 inches above the finished grade.
- C. Balled and burlapped trees shall have planting soil placed and compacted around base of ball to fill all voids. All burlap, ropes or wires shall be removed from the sides and tops of balls.
- D. All ground cover plants shall be evenly spaced, staggered in rows, and set at intervals specified, so as to produce a uniform effect. Plants shall be watered immediately after planting operations have been completed.
- E. All shrubs and vines shall be pruned to remove damaged branches. All bare root shrubs shall be pruned and shaped to compensate for transplant root loss.
- F. Planting soil around roots or balls shall be thoroughly compacted and watered. After planting, the soil in the shrub beds shall be cultivated between shrubs, raked smooth, and neatly outlined. Muddy soil shall not be used for backfilling. All broken or frayed roots shall be properly cut off.
- G. Trees and shrubs on slopes steeper than 6 to 1 shall be provided with watering dams or berms at least 6 inches high and 8 inches wider than planting pit (hole) unless specified or shown otherwise.
- H. All trees shall be thoroughly watered immediately after planting.
- I. Remove all tags and labels when directed by OWNER.

3.9 STAKING AND TREE WRAPPING

- A. Staking of trees shall be done immediately after they are planted. Plants shall stand plumb after staking. Staking shall be as indicated on Drawings.

- B. Trees 2-inch caliper and less shall be supported by 2 stakes placed diametrically opposite at perimeter line of ball and to sufficient depth to hold tree rigid. Stakes shall be driven vertically and not twisted or pulled. Trees shall be wired to each stake as indicated on Drawings.
- C. All deciduous trees greater than 2-inch caliper and all evergreen trees 6'-0" and taller shall be triple staked or guyed as indicated on Drawings.

3.10 PRUNING AND MULCHING

- A. Each tree and shrub shall be pruned in accordance with standard horticultural practice to preserve the natural character of the plant in the manner fitting its use in the landscape design. Prune plant material only as approved by the OWNER.
- B. All dead wood or suckers and all broken or badly bruised branches shall be removed by thinning out and shortening branches. Deciduous bare-rooted plants shall have not less than 1/3 of their respective leaf surfaces removed. All cuts shall be made just above a healthy bud. Pruning shall be done with clean, sharp tools.
- C. Plants shall be mulched after planting and cultivating have been completed. A layer of mulch materials, as hereinbefore specified, shall be spread on finished landscaping grade within all planting areas to depths as indicated on the drawings. The mulch around isolated trees shall be 3 feet in diameter. All shrub and ground cover beds shall be completely covered with the mulch as indicated on the Drawings.

3.11 MISCELLANEOUS ITEMS

- A. Mulch shall be placed in the planting areas as shown, spread carefully and evenly to a depths as indicated on the drawings over the entire area. Bark mulch installed in tree rings in turf areas.
- B. Rock mulch shall be placed in the landscape areas as noted on plans, spread carefully and evenly to a minimum depth as noted on plans over weed barrier fabric.
- C. Install weed barrier fabric only under rock mulch areas – see plans.

END OF SECTION

SECTION 33 0506
POLYETHYLENE PIPE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Polyethylene pipe, couplings, fittings and joint materials.

1.2 REFERENCES

- A. AASHTO M 252: Standard Specification for Corrugated Polyethylene Drainage Pipe.
- B. AASHTO M-294: Standard Specification for Corrugated Polyethylene Drainage Pipe 300-1200 mm Diameter.
- C. AASHTO MP7-97: Standard specification for Corrugated Polyethylene Pipe – 1350 and 1500 mm Diameter.
- D. ASME B1.1: Unified Inch Screw Threads (UN and UNR Thread Form), Supplement.
- E. ASTM A 307: Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
- F. ASTM D 2239: Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Inside Diameter.
- G. ASTM D 2321: Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
- H. ASTM D 2657: Standard Recommended Practice for Heat Joining of Thermoplastic Pipe and Fittings.
- I. ASTM D 2774: Standard Recommended Practice for Underground Installation of Thermoplastic Pressure Piping.
- J. ASTM D 3261: Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
- K. ASTM D 3350: Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
- L. ASTM F 477: Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- M. ASTM F 1055: Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing.

1.3 DEFINITIONS

- A. Standard Dimension Ratio (SDR): Average diameter of pipe divided by the minimum wall thickness. The diameter may be either inside or outside measurement depending upon which standard is referenced.
- B. Code Designation: A rating system by the Plastic Pipe Institute for smooth wall polyethylene pipe materials. The designation PE 3408 designates the type of plastic

pipe (PE), the grade (34), and the hydrostatic design stress measured in units of 100 psi (08) at 23 deg C.

PART 2 - PRODUCTS

2.1 SMOOTH WALL PIPE SYSTEMS

- A. Material: PE 3408 per ASTM D 2239 with a minimum cell classification of 345434C per ASTM D 3350.
- B. Pipe: Smooth wall inside and out with an SDR or working pressure rating indicated or accepted by OWNER. Exterior markings as follows.
 - 1. ASTM Standard Number.
 - 2. Pipe Size.
 - 3. Class and profile number.
 - 4. Production code.
 - 5. Standard dimension ratio.
- C. Fittings:
 - 1. Resin same as pipe.
 - 2. Working pressure same or greater than pipe.
- D. Joints:
 - 1. Thermally welded butt fusion, ASTM D 3261.
 - 2. Flanged, ASTM D 2657.
 - 3. Ultra high molecular weight electro-fusion tape with a polyethylene coupler meeting ASTM F 1055 requirements.

2.2 CORRUGATED WALL PIPE SYSTEMS

- A. Material: Polyethylene, ASTM D 3350 with a cell class as required in AASHTO M 252, AASHTO M 294 or AASHTO MP7-97
- B. Pipe: Type S or D unless specified otherwise. Corrugations may be either annular or helical.

<u>Type</u>	<u>Description</u>
C	Circular pipe with a corrugated surface inside and out.
CP	Type C pipe with perforations
S	Circular pipe with an outer corrugated wall and a smooth inter wall
SP	Type S pipe with perforations
D	Circular pipe with a corrugated wall sandwiched between a smooth outer wall and a smooth inner wall.

- C. Fittings:
 - 1. Blow molded with cell class 335420C, ASTM D 3350.

2. Rotational molded with cell class 213320C, ASTM D 3350.
 3. Shop or field remanufactured of the same material as the pipe
- D. Joints:
1. Bell and spigot with gaskets, ASTM F 477. Foam type weather stripping not allowed.
 2. Split corrugated couplings with plastic or stainless steel ties and leak resistant neoprene gasket.

2.3 NUTS AND BOLTS

- A. Carbon steel machined heavy hex heads, Class 2 fit, ASTM A 307; Grade B, threads, ASME B1.1.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install pipe as per manufacturer's instructions, ASTM D 2321 or ASTM D 2774.
- B. Water distribution and transmission, Section 33 12 19.
- C. Gravity water systems, Section 33 31 00 or Section 33 41 00.
- D. Irrigation Systems, Section 32 84 23.
- E. Tape wrap steel materials for protection against corrosion after piping installation.

END OF SECTION