PROJECT MANUAL

FOR

HYRUM CITY
ESTABLISHED 1860

LIBBIE SPRINGS PARK

AT
20 NORTH 680 WEST
HYRUM, UT 84319

PRIME
LANDSCAPE ARCHITECTURE
Nibley, Utah 84321
801.528.2856

FEBRUARY 2025

SECTION 00 0102

PROJECT INFORMATION

PART 1 GENERAL

1.01 PROJECT IDENTIFICATION

A. Project Name: Libbie Springs Park, located at:

20 North 680 West

Hyrum, Utah 84319

B. The Owner, hereinafter referred to as Owner: Hyrum City

1.02 PROJECT DESCRIPTION

A. Summary Project Description:

1. New park construction on a portion of a 3.4 acre parcel owned by city. Park is to include open grass space, restroom, pickleball, basketball, playground, improved waterway, landscape and irrigation, etc. See plans for additional information.

1.03 PROCUREMENT TIMETABLE

A. The Owner reserves the right to change the schedule or terminate the entire procurement process at any time.

1.04 PROCUREMENT DOCUMENTS

A. Availability of Documents: Complete sets of procurement documents may be obtained:

1. From Owner at the Project Manager's address listed above.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 00 0103

PROJECT DIRECTORY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Identification of project team members and their contact information.

1.02 OWNER:

A. Name: Hyrum City.
   1. Address Line 1: 60 West Main.
   2. City: Hyrum.
   3. State: Utah.
   4. Zip Code: 84319.
   5. Telephone: 435-245-6033.

B. Primary Contact: All correspondence from the Contractor to the Architect will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
   1. Title: Parks Superintendent.
   2. Name: Ned Fredrickson.

1.03 CONSULTANTS:

A. Architect: Design Professional of Record. All correspondence from the Contractor regarding construction documents authored by Architect's consultants will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
   1. Company Name: Prime Landscape Architecture.
      a. Address Line 1: 1524 West 3045 South.
      b. City: Nibley.
      c. State: Utah.
      d. Zip Code: 84321.
      e. Telephone: 801-528-2856.
   2. Primary Contact: .
      a. Title: Landscape Architect.
      b. Name: Dustin Hislop.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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B. 32 3113 - Chain Link Fences and Gates
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2.08 DIVISION 33 -- UTILITIES

A. 33 4100 – NOT INCLUDED

END OF SECTION

SECTION 00 0115

LIST OF DRAWING SHEETS

HYRUM CITY – LIBBIE SPRINGS PARK

PER PLAN

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END OF SECTION

SECTION 01 1000

SUMMARY

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

1.02 PROJECT

A. Project Name: Libbie Springs Park

B. Owner's Name: Hyrum City

C. Landscape Architect's Name: Prime Landscape Architecture

D. Project Location:

1. Libbie Springs Park
   20 North 680 West
   Hyrum, Utah 84319

E. Full site construction of park elements as previously stated and as shown in project construction documents. Southern portion of property is to be preserved and protected. Grading of existing high points is to be done to drop elevation several feet per drawings. Graded material to be added to south slope per drawings. Imported material consists of topsoil and boulders per plan. As part of project coordination with city hired playground & restroom consultant will be needed as part of project. See plans for detailed information.

1.03 CONTRACT DESCRIPTION

A. Documents indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not necessarily limited to the following:

1. Existing site conditions & restrictions on use of the site.

1.04 SUMMARY BY REFERENCES

A. Work of the Contract can be summarized by references to the Contract, General Conditions, Supplementary Conditions, Specification Sections, Drawings, Addenda and modifications to the contract documents issued subsequent to the initial printing of this project manual and including, but not necessarily limited to, printed material referenced by any of these. It is recognized that work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon, including weather conditions, and other forces outside contract documents.

1.05 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

1. Locate and conduct construction activities in ways that will limit disturbance to site.
2. Confine operations on site to the areas permitted under the Contract. Portions of the site beyond areas which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work while engaged in project construction.
3. Keep all public areas free from accumulation of waste material, rubbish or construction debris.
4. Smoking or open fires will not be permitted on the premises.

B. Provide access to and from site as required by law and by Owner:
   1. Do not obstruct roadways, sidewalks, or other public ways without permit.
   2. Maintain Fire Department access to the site at all times.

C. Existing building spaces may not be used for storage.

1.06 WORK SEQUENCE

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2000

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Change procedures.

1.02 RELATED REQUIREMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

1.03 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Landscape Architect for approval.

B. Forms filled out by hand will not be accepted.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

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

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Landscape Architect for approval.

C. Forms filled out by hand will not be accepted.

D. Execute certification by signature of authorized officer.

E. Submit one electronic and three hard-copies of each Application for Payment.

1.05 PAYMENT REQUESTS

A. General: Except as otherwise indicated, sequence of progress payments is to be regular, and each must be consistent with previous applications and payments. It is recognized that certain applications involve extra requirements, including initial application, application at times of substantial completion, and final payment application.

B. Payment Application Times:

1. The date for each progress payment is indicated in the Owner-Contractor Agreement or, if none is indicated therein, it is the 15th day of each month.
2. The period of construction work covered by each payment request is indicated in the Owner-Contractor Agreement or, if none is indicated therein, it is the period ending 15 days prior to the date for each progress payment, with the starting day following the end of the preceding period.

1.06 MODIFICATION PROCEDURES

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

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

1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
2. Promptly execute the change.

C. For changes for which advance pricing is desired, Landscape Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for

executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 5 days.

D. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

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

1.07 APPLICATION AND CERTIFICATE FOR PAYMENT

A. Payment Request Form will be the form used as an Application and Certificate for Payment for this Project. Form shall be provided by contractor.

B. Application Preparation:
   1. Except as otherwise indicated, complete every entry provided for on the form, including notarization and execution by authorized persons. Incomplete applications will be returned by Landscape Architect/Engineer without action.
   2. Entries must match current data of schedule of values and progress schedule and report.
   3. Listing must include amounts of change orders issued prior to last day of the "period of construction" covered by the application.

C. Initial Payment Application: The principal administrative actions and submittals which must precede or coincide with submittal of first payment application, is summarized as follows, but not necessarily by way of limitation:
   1. Listing of subcontractors and principal suppliers and fabricators. (Final list)
   2. Schedule of values.
   3. Progress schedule (preliminary, if not final.)
   4. Schedule of unit prices.
   5. Schedule of submittals (preliminary, if not final.)
   6. Listing of Contractor's staff assignments and principal consultants.
   7. Copies of acquired building permits and similar authorizations and licenses from governing authorities for current performance of the work.
   8. Performance and/or payment bonds (unless required sooner.)
   9. Evidence satisfactory to Owner that Contractor's insurance coverages have been secured.
   10. Data needed to acquire Owner's insurance coverages.
   11. Initial progress report, including report of pre-construction meeting.

D. Application at Time of Substantial Completion: Following issuance of Architect's or Engineer's final "Certificate of Substantial Completion," and in part as applicable to prior certificates on portions of completed work as designated, a special payment application may be prepared and submitted by Contractor. The principal administrative actions and submittals which must proceed or coincide with such special applications are summarized in Section 01 7700 Closeout Procedures.

E. Final Payment Application: The administrative actions and submittals which must precede or coincide with submittal of final payment application can be summarized as follows, but not necessarily by way of limitation:
   1. Completion of project closeout requirements.
   2. Completion of items specified for completion beyond time of substantial completion (regardless of whether special payment application was previously made.)

3. Assurance, satisfactory to the Owner, that unsettled claims will be settled and that work not actually completed and accepted, will be completed without undue delay.

G. Application Transmittal: Submit digital copy of each payment application, one copy of which is completed with waivers of lien and similar attachments. Transmit each copy with a transmittal form listing those attachments, and recording appropriate information related to application in a manner acceptable to Architect/Engineer. Transmit to Architect/Engineer by means ensuring receipt within 24 hours.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2116

CONTINGENCY ALLOWANCES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section includes administrative and procedural requirements governing allowances
   1. Contingency allowances.

1.03 DEFINITIONS

A. Allowance is a quantity of work or dollar amount established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.04 SELECTION AND PURCHASE

A. At Landscape Architects request, obtain proposals for each allowance for use in making final selections. Include recommendations that are to performing the Work.

B. Purchase products and systems selected by Landscape Architect from the designated supplier.

1.05 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.06 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Landscape Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. Contractors overhead profit and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include installation, taxes (as applicable), insurance, equipment rental, and similar costs.

C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable and profit.

D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.02 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.03 SCHEDULE OF ALLOWANCES

A. General Construction Contingency Allowance: Include a contingency allowance of $20,000.00 for use according to Owner's written instructions.

END OF SECTION

SECTION 01 2500

SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

1.02 SUMMARY

A. This section sets out procedures for requesting substitutions for products, material, equipment, method or process, in lieu of that specified.

1.03 RELATED REQUIREMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

1.04 DEFINITIONS

A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.

1.05 SYSTEM DESCRIPTION

A. Legitimate proposed substitutions, if submitted as required and accompanied by necessary documentation, will be entertained by the Owner for inclusion in the Contract Documents.
   1. No substitutions or variations from the Contract Documents will be permitted except as described herein.

B. A proposed material or equipment which is not shown to be at least equal in quality and fully equivalent in performance to that specified, will not be accepted.

C. Acquire “Request for Substitutions Form” and submit as part official review.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURE

A. Requests for substitution may not be submitted for consideration at any juncture in the project, only during the bidding process of the project.

B. Prior to Execution of the Contract:
   1. During Bidding:
      a. Make submittal using the Voluntary Substitution Sheet upon request.
      b. Indicate the name, manufacturer, model number, etc. of the proposed substitution, along with the effect on the Bid amount for each proposed substitution.
      c. The Owner will evaluate the proposed substitution prior to execution of the Agreement.
      d. If acceptable, the substitution will be incorporated by reference into the Agreement, and become part of the Contract Documents. The Contract Sum will reflect the net adjustment due to all accepted substitutions.
      e. If not accepted, the Contractor shall provide the originally specified item.

3.02 CONTRACTOR'S RESPONSIBILITIES

A. The following requirements apply to all requests for substitutions, whether proposed during bidding or during construction:
   1. Request for consideration of substitute items shall be originated by the Contractor.

2. The request shall be accompanied by a Request for Substitution form (or Voluntary Substitution Sheet, if during bidding), and by all data necessary to demonstrate conformance with the Contract Documents, and shall show any deviation from the item specified. The data shall include all special attachments and requirements for the trade involved as well as any other trades affected.
3. If the substitution of any material or equipment increases costs to the Contractor, or any other Contractor or subcontractor on the Project, then these costs shall be borne by the Contractor providing the substitution.
4. If the substitution of any material or equipment requires a revision of design, the Contractor shall submit to the Owner a complete and detailed design for review before commencing work.

B. In all instances of substitutions, the Contractor shall assume full responsibility for having all substitutions comply in all respects with the applicable portions of the Contract Documents, codes, regulations, and standards, except where any such requirements are specifically waived in writing.
   1. Evidence of full equivalency of the requested substitute to the specified product, lies fully at the responsibility of the submitting Contractor, and shall be clearly shown in complete comparative documentation.

C. In the event the Owner's evaluation of the proposed substitution reveals that a redesign is necessary to accommodate the substitution, the cost for such redesign shall be borne by the Contractor.

D. The Architect's fee for investigating and evaluating a proposed substitution's compliance with the Contract Documents shall be borne by the Contractor, whether the substitution is accepted or not.

E. The Contractor is responsible to ensure that materials and equipment to be furnished fit the space available. Make necessary investigations to ascertain space requirements, including those for connections and maintenance. Order such sizes and shapes of equipment that the final installation will meet the true intent and meaning of the Contract Documents and will fit into the space allocated with adequate room for servicing.
   1. The Contractor requesting or utilizing an approved substitution, shall be responsible for coordinating all necessary changes with other Contractors and subcontractors affected.

END OF SECTION

SECTION 01 2600

CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements to be used when processing modifications to the Contract Documents, involving potential changes to the Contract Sum or Time for Completion, or both.

1.03 DEFINITIONS

A. Addendum: A written instrument issued by the Landscape Architect or Owner prior to bidding, with or without graphical or text attachments, delineating changes in, and/or clarifications to the Bidding Documents.

B. Proposal Request: A written instrument, issued by the Landscape Architect, describing proposed changes in the Work, and requesting proposals for the changes.

C. Contractor's Proposal: A written response to a Proposal Request, from the Contractor(s), detailing proposed changes in cost or time to the project.

D. Change Order: Order, approved by Owner, Landscape Architect and Contractor, which modifies the Contract, Contract Sum and/or Contract Time.

E. Construction Change Directive: Order approved by Owner and Landscape Architect, which modifies Contract, but without Contractor agreement.

1.04 ADDENDA

A. Addenda are issued prior to submittal of bids.
   1. The cost for each of the changes included in an Addendum, and elected by the Owner prior to execution of the Agreement, shall be used to appropriately modify the original Contract Sum, submitted as a bid.

B. Since the Contractor has included the cost and time impacts on the Work as part of its bid, Addenda modifications will be incorporated into the Contract Documents, with no further response or input required from the Contractor.

1.05 PROPOSAL REQUESTS

A. After execution of the Agreement, the Landscape Architect may, from time to time, at the request of the Owner, issue Proposal Requests to the Contractor (or one or more prime Contractors).
   1. Proposal Requests contain proposed changes, and requests for proposal(s).
   2. Proposal Requests include either a verbatim detail of the proposed change(s), or a caption description of such changes, accompanied by copies of revised documents.
   3. The form and format of how the proposed changes are conveyed is at the sole discretion of the Landscape Architect.
   4. When copies of revised documents are attached to the written Proposal Request, the revisions shown on the documents shall take precedence over any other description thereof.
   5. The fact that an item may appear on a revised document, but not on the written Proposal Request does not relieve the Contractor from including the change in the Contractor's Proposal.

6. No change included in a Proposal Request shall be deemed as a notice to proceed with such change, until a Change Order is properly executed for same.

1.06 CONTRACTOR'S PROPOSALS

A. Upon receipt of a Proposal Request, the Contractor shall, without delay, assemble proposed costs for all changes included therein, and shall prepare a Contractor's Proposal for the Work.
   1. Contractor's Proposal shall include all costs associated with the Proposal Request, as well as any effect on the Time for Completion for the project.
   2. Costs shall be clearly delineated for each portion of the work, and shall include the basis for determination for each item, such as unit costs, lump sum costs, subcontractor/supplier quotes, etc.
      a. Unit Costs: Indicate product or material, units measured, previous quantity, new quantity, net change, unit cost, and total cost. Where unit costs for the same item are included in the Agreement or other Contract Document, the agreed-to costs must be used for all adjustments.
      b. Lump Sum Costs: Indicate individual labor and material costs for each item.
      c. Subcontractor/Supplier Quotes: Include signed copies of proposals or quotes from the subcontractor or supplier.
      d. The Contractor's Proposal may include a combination of the above methods of calculation.
   3. Tabulate costs for all Work, itemized as appropriate, and include line items for Contractor's overhead and profit and administrative expenses.
   4. Tabulate costs for all Work, itemized as appropriate, and include line items for Contractor's fee, administrative costs, and anticipated reimbursable expenses.
   5. The Owner reserves the right to require the Contractor to competitively bid any or all items of the Work; the bid selected by the Owner shall be included on the Contractor's Proposal for each item bid.
   6. The Owner reserves the right to delete any combination of items included in the Contractor's Proposal, with a subsequent adjustment of the Contractor's overhead and profit and administrative expenses, as appropriate.
   7. If the basis of payment is Cost of Construction Plus a Fee, with a Guaranteed Maximum Price (GMP), the Contractor's Proposal may indicate a proposed change to the GMP and, if accepted by the Owner, may proceed with the Work under the same accounting requirements as for the rest of the Work.

1.07 CHANGE ORDERS

A. If the Owner accepts the Contractor's Proposal, a Change Order will be processed, including all selected changes and corresponding adjustments to the Contract Sum and/or Contract Time. Where the basis of payment is Cost of Construction Plus a Fee, with a Guaranteed Maximum Price (GMP), the GMP will be adjusted.

B. The Scope of Work, Contract Sum, Guaranteed Maximum Price, and Contract Time can only be modified by proper execution of a Change Order.

1.08 CONSTRUCTION CHANGE DIRECTIVES

A. In the absence of complete agreement on Proposal Request adjustments between the Owner and the Contractor, a Construction Change Directive for the changes may be executed by the Owner.
   1. The Contractor shall promptly proceed with the Work included therein, and cost and time adjustments will be determined as described in the General Conditions.

1.09 ORDERS FOR MINOR CHANGES IN THE WORK

A. The Owner or Landscape Architect may, from time to time, issue to the Contractor orders for minor changes in the work, which do not have the effect of changing either the Cost of the Work or the Time for Completion.

B. An order for minor changes in the work may be of any form or format the Owner or Landscape Architect deems appropriate and need only convey the intended changes adequately to communicate them to the Contractor.

1.10 PART 2 PRODUCTS - NOT USED

1.11 PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 3100

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

1.02 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. General coordination procedures.
   2. Coordination drawings.
   3. Requests for Information (RFIs).
   4. Project website.
   5. Project meetings.

B. Related Requirements
   1. Section 01 7700 "Closeout Procedures" for coordinating closeout of the Contract.

1.03 DEFINITIONS

A. Requests for Information (RFI): Request from Owner, General Contractor, Landscape Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.04 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
   1. Name, address, and telephone number of entity performing subcontract or supplying products.
   2. Number and title of related Specification Section(s) covered by subcontract.
   3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within fifteen (15) days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
   1. Post copies of list in project meeting room, in temporary field office, on Project website, and by each temporary telephone. Keep list current at all times.

1.05 GENERAL COORDINATION PROCEDURES

A. Contractor shall coordinate construction activities included under various Sections of these Specifications to ensure efficient and orderly installation of each part of the Work.
   1. Where availability of space is limited, coordinate installation of different components to ensure maximum accessibility for required maintenance, service and repair.
   2. Make adequate provisions to accommodate items scheduled for later installation.

B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Contractor's construction schedule.
   2. Preparation of the schedule of values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of submittals.
   5. Progress meetings.
   6. Pre-installation conferences.
   7. Project closeout activities.
   8. Startup and adjustment of systems.

C. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1.06 DRAWINGS

A. Drawings are diagrammatic and indicate general arrangement of systems and other work.

B. Prior to the installation of material and equipment, review all drawings for exact locations and where not definitely indicated, request information from Architect.

C. Check all drawings to verify spaces in which work will be installed.

D. Make reasonable modifications in layout needed to prevent conflict with work of other contractors.

E. Some revision of the exact location of individual electrical or mechanical devices and equipment, doors, openings, fixtures, and the like may be made by the Owner and/or Landscape Architect, at their discretion.
   1. Such revisions when they occur within 10 feet of indicated locations shall be at no additional cost, provided that the Contractor is notified of such action in a timely manner, and that related construction which would interfere with or preclude the new location has not been permanently installed.
   2. Relocation described above may be necessitated by coordination and interface between various trades and not through direct action of the Owner or Landscape Architect. In such cases, obtain approval from the Landscape Architect prior to proceeding.

1.07 EXISTING CONDITIONS

A. In the performance of the work, the Contractor is totally responsible and liable for the protection and safety of the Work and the Owner's property and shall use such means, procedures and methods as he deems necessary for the safe execution of the work.

B. Contractors whose work is dependent on the location, size, or shape of existing construction shall make whatever field inspection and dimensioning as is required to ensure the proper fit of their work.
   1. If existing conditions are not in accordance with the Contract Documents and will in any way affect the installation of new work, Contractor shall report discrepancies to the Landscape Architect and Owner before proceeding with any related new work.

C. Contractor is responsible for any extra expense in connection with his work or for damage to the Owner's property or adjacent property owners caused by failure to comply with the requirements of these specifications.

1.08 REQUESTS FOR INFORMATION (RFI'S)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
   1. Landscape Architect will return RFIs submitted to Landscape Architect by other entities controlled by Contractor with no response.
   2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
   1. Project name.
   2. Project number.
   3. Date.
   4. Name of Contractor.
   5. Name of Landscape Architect [and General Contractor].
   6. RFI number, numbered sequentially.
   7. RFI subject.
   8. Specification Section number and title and related paragraphs, as appropriate.
   9. Drawing number and detail references, as appropriate.
   10. Field dimensions and conditions, as appropriate.
   11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
   12. Contractor's signature.
   13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
      a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Document form with substantially the same content as indicated above, acceptable to Architect.
   1. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Landscape Architect's Action: Landscape Architect will review each RFI, determine action required, and respond. Allow seven (7) working days for Landscape Architect's response for each RFI.
   1. The following Contractor-generated RFIs will be returned without action:
      a. Requests for approval of submittals.
      b. Requests for approval of substitutions.
      c. Requests for approval of Contractor's means and methods.
      d. Requests for coordination information already indicated in the Contract Documents.
      e. Requests for adjustments in the Contract Time or the Contract Sum.
      f. Requests for interpretation of Architect's actions on submittals.
      g. Incomplete RFIs or inaccurately prepared RFIs.
   2. Landscape Architect's action may include a request for additional information, in which case Landscape Architect's time for response will date from time of receipt of additional information.
   3. Landscape Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 2600 "Contract Modification Procedures."

a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Landscape Architect and Owner in writing within ten (10) days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:
   1. Project name.
   2. Name and address of Contractor.
   3. Name and address of Landscape Architect.
   4. RFI number including RFIs that were returned without action or withdrawn.
   5. RFI description.
   6. Date the RFI was submitted.
   7. Date Architect's response was received.

F. On receipt of Landscape Architect's and General Contractor's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Landscape Architect and General Contractor within seven (7) days if Contractor disagrees with response.
   1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

1.09 PROJECT MEETINGS

A. General: General Contractor will schedule and conduct meetings and conferences at Project site unless otherwise indicated.
   1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Landscape Architect of scheduled meeting dates and times.
   2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
   3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, General Contractor, and Landscape Architect, within three (3) days of the meeting.

B. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.

C. Project Closeout Conference: General Contractor will schedule and conduct a project closeout conference, at a time convenient to Owner and Landscape Architect.

D. Progress Meetings: General Contractor will conduct progress meetings at weekly intervals.
   1. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
      a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      b. Review schedule for next period.
      c. Review present and future needs of each entity present.
   2. Minutes: General Contractor will record and distribute the meeting minutes to each party present and to parties requiring information.

a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

E. Coordination Meetings: General Contractor will conduct project coordination meetings at regular intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and pre-installation conferences.

1.10 PART 2 PRODUCTS - NOT USED

1.11 PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 3119

PROJECT MEETINGS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.02 PRE-CONSTRUCTION CONFERENCE

A. Preconstruction conferences between the General Contractor & Landscape Architect and Subcontractors shall be held at the site prior to commencement of the work. This meeting is to be for the purpose of resolving current problems, further orienting Contractor to requirements of the Contract Documents, informing Contractor of Landscape Architect's responsibility to Owner for construction observation, and working out with the Contractor a general schedule of construction observation.

1.03 PROGRESS MEETINGS

A. Weekly job site progress meetings will be held by the General Contractor & the Landscape Architect to insure all activities are being coordinated properly on the project and to assist in staying on schedule. Status of submittals, changes, progress payments, material delivery, and other matters will be reviewed. The General Contractor will conduct such meetings and will require subcontractors currently involved in the construction progress and those anticipated to begin work in the following period to attend, without exception.

B. The Landscape Architect shall attend these job site progress meetings not less than once every week while construction work is in progress to observe and familiarize himself with the progress and compliance of the work; and to determine for the Owner's benefit if the work is proceeding in accordance with the intent of the Contract Documents. The General Contractor & Landscape Architect shall determine if, in their opinion, the construction is proceeding according to schedule. The Landscape Architect's opinion shall be based on bi-weekly updated critical path construction schedules provided by the General Contractor, Landscape Architect's observations. The General Contractor & Landscape Architect shall keep the Owner informed of the progress and compliance of the work and inform the Owner of any failure by the Contractor to carry out work in accordance with the intent of the Contract Documents.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

END OF SECTION

SECTION 01 3200

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
   1. Startup construction schedule.
   2. Contractor's construction schedule.
   3. Construction schedule updating reports.
   4. Special reports.

B. Related Requirements:
   1. Section 01 3300 "Submittal Procedures" for submitting schedules and reports.

1.03 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
   1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
   2. Predecessor Activity: An activity that precedes another activity in the network.
   3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by Landscape Architect.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.
   1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
   2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
   3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.04 INFORMATIONAL SUBMITTALS

A. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
   1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.

1.05 COORDINATION

A. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

PART 2 PRODUCTS

2.01 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for commencement of the Work the Notice to Proceed to date of Substantial Completion.
   1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

2.02 STARTUP CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

2.03 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within two (2) days of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 EXECUTION

3.01 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
   1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
   2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
   3. As the Work progresses, indicate final completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Landscape Architect, Construction Manager, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
   1. Post copies in Project meeting rooms and temporary field offices.

2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01 3300

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

1.02 SUMMARY

A. This section includes requirements for submission of shop drawings, product data, samples, and other submittals.

B. Some information submitted under this section may be required to also be included in operation and maintenance manuals, under provisions of Section 01 7700. In such cases, submit information as required herein, and include approved copy in manuals upon completion of project.

1.03 GENERAL

A. All submittals, of every type, shall be specific to the work of this project.
   1. Where standardized information or drawing sheets are utilized, they shall bear such indications as necessary to identify the specific product, equipment or other item to be provided for this project.

B. Specific shop drawings, product data, samples, and other submittals to be submitted to Architect for review are indicated in individual specification sections. Other similar information may be required by the Contractor or subcontractor(s) for coordination, but is not to be submitted to or reviewed by the Architect.
   1. If required by individual specification sections, submit information to Owner and/or Architect for their information or record purposes only. Such submittals may or may not be formally reviewed and commented upon by either the Owner or Architect.

C. Submittals not requested by the individual specification sections will be returned to the Contractor not reviewed. Lack of Architect's review of non-requested submittals does not relieve the Contractor from complying with requirements of the Construction Documents, and does not, in any way, imply acceptance or approval of anything contained in the submittal which is not in compliance with the Construction Documents.

D. Dimensions and Quantities: The Architect shall not be responsible for the accuracy or completeness of dimensions or quantities indicated on submittals. Dimensions and quantities which are necessary for construction, but are not discernable or calculable from the Construction Documents, shall be formally requested of the Architect by the Contractor through a Request for Information or other similar process.
   1. Wherever required, or possible, dimensions and configurations shown on submittals shall be based on field verified information.

E. If the Architect, during its review, discovers errors, omissions or deviations from the Contract Documents in submittals, such errors, omissions, or deviations will be noted; however, the Architect shall not have a duty to discover errors, omissions, or deviations in submittals, and shall not in any way be responsible for those not discovered.

F. Deviations from Contract Documents: Submittals shall not contain deviations from the requirements of the Contract Documents, unless such deviations are specifically and conspicuously indicated as such. Deviations, even if so indicated, shall not be considered as approved unless accepted in writing by the Architect and Owner.

Deviations which include substitutions of products or materials, or which constitute significant departures from the design intent of the Contract Documents shall be submitted as "Substitution Procedures", under provisions of Section 01 2500.

1.04 SUBMITTAL SCHEDULE

A. Prepare and submit with the construction schedule, a separate schedule listing dates for submission of shop drawings, product data, and samples that will be needed for each product.

B. The schedule shall reflect an orderly sequence coordinated to maintain an orderly flow of work, and shall agree with the Progress Schedule.

C. The dates indicated shall allow ample time for reviewing, correcting and resubmitting as necessary for review, and ample time for procurement of products after final approval.
   1. A period of not less than five (5) working days shall be allocated for Architect/Owner reviews.

D. Submit shop drawings, product data, samples, and other items not later than two (2) weeks prior to date indicated for receipt of reviewed submittals on Progress Schedule; allow more time for complicated submittals. No extension of time will be granted to the Contractor because of failure to expeditiously submit shop drawings or samples in ample time to allow for the full review process.

1.05 DEFINTIONS

A. Shop Drawing: Original drawings, prepared by Contractor, subcontractor, supplier or distributor, which illustrate some portion of the work, showing fabrication, layout, setting and erection details.

B. Product Data: Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard description data.

C. Sample: Physical examples to illustrate materials, workmanship, and to illustrate standards by which completed work is judged.

1.06 SHOP DRAWINGS

A. Where required, engage the services of design professionals, registered in state where project is located, to produce, or supervise production of shop drawings. Drawings shall be sealed and signed by such design professional, prior to submittal for review.

B. At a minimum, all shop drawings shall:
   1. Clearly indicate application details specific to this Project.
   2. Include construction information relative to the installation of the product or system to this Project.
   3. Modify manufacturer’s standard details, where utilized, to illustrate construction and conditions specific to this Project.
   4. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

C. Shop drawings shall not include the phrase “by others,” except when relating to materials not included under the total Contract.
   1. If such notation is included on shop drawings submitted to the General Contractor by a subcontractor or supplier, the General Contractor shall annotate drawing to indicate that the General Contractor or another subcontractor shall provide the item.

1.07 PRODUCT DATA

A. Mark each copy to identify materials, products or models pertinent to this project.
   1. Clearly indicate options, custom modifications, finishes, colors, and other selected features to be provided.
   2. Indicate dimensions and clearances required.
   3. Indicate performance characteristics and capacities.
   4. Include wiring diagrams and controls, where applicable.

B. Manufacturer's Standard Drawings:
   1. Modify drawings to delete information which is not applicable to project.
   2. Supplement standard information to provide additional information applicable to project.

1.08 SAMPLES

A. Submit samples of sizes indicated in specification sections or, if not indicated, of sufficient size to clearly illustrate:
   1. Functional characteristic of product or material, with integrally related parts and attachment devices.
   2. Texture and color, if selected, including full range of variation thereof, if applicable.

B. If texture and color has not been selected, submit samples indicating full range of manufacturer's available textures and colors for selection.

C. Field samples and mock-ups:
   1. Comply with specific requirements of individual specification sections.
   2. Erect at location on project site acceptable to Owner.
   3. Construct each field sample or mock-up complete, including work of all trades required in finished work.

1.09 CONTRACTOR'S RESPONSIBILITIES

A. Contractor shall review shop drawings, product data and samples and affix stamp of approval, prior to submission to Landscape Architect/Owner.
   1. Language on Contractor's submittal review stamp shall be consistent with the requirements of the Agreement and General Conditions.
   2. A stamp containing language which defers or assigns Contractor's responsibilities to subcontractor will not be permitted; submittals bearing a stamp with such language will be returned without action. Any delay due to such rejection will not be grounds for an extension of Contract Time.
   3. Submittals without Contractor's review stamp will not be considered and will be returned for resubmission.
   4. Mark each submittal to indicate comments, corrections required, etc. If deficiencies cannot be properly corrected with remarks or corrections, reject submittal and return to submitter; do not forward rejected submittals to Landscape Architect.

B. Verify:
   1. Field Measurements
   2. Field Construction Criteria
   3. Catalog Numbers and Similar Data
   4. Quantities

C. Coordinate each submittal with requirements of the Construction Documents.

D. Notify Landscape Architect in writing, at time of submission, of deviations in submittals from requirements of Construction Documents, including the reason(s)

for such deviation and the effects on other portions of the Work, if any. The Architect shall not be responsible for deviations from the Construction Documents not clearly indicated as such and specifically approved in writing by the Architect.

E. When work is directly related and involves more than one trade, submittals shall be coordinated by the Contractor and submitted under a single cover.
   1. After a submittal has been submitted for review, revisions are not permitted to that submittal except changes in response to comments made by the Architect, unless such changes are clearly identified and resubmitted to the Architect.

1.10 SUBMISSION REQUIREMENTS

A. Media: Submit clear, legible, hard copy documents, either originals or copied directly from originals (first generation copy).
   1. Faxed documents are not acceptable.

B. All copies submitted shall be identical and shall be reproduced from the same original, if applicable.

C. Quantities required:
   1. Shop Drawings: One (1) reproducible transparency and two (2) hard copies or prints.
   2. Product Data: Four (4) copies
   3. Samples: Three (3) each unless otherwise indicated in specification sections. For submission of available colors or finishes for selection purposes, submit one (1) set of samples, with each clearly marked with name and/or numeric identification. Architect will retain selected sample(s) and communicate selection(s) by reference.
   4. Miscellaneous Submittals: Four (4) copies, unless otherwise indicated in specification sections.
   5. Submittals for Information or Record Purposes Only: Two (2) copies, unless otherwise indicated in specification sections.

D. Submittals shall be accompanied by a transmittal form or letter, in duplicate, containing the following:
   1. Date.
   2. Project title and number.
   3. Contractors name, address, and telephone number.
   4. The number of each shop drawing, product data and sample submitted; correlate number with identifying number in Submittal Schedule.
   5. Identification of product or material, including the specification section(s) requiring the submittal.

E. Submittals shall include the information listed on the transmittal, plus the following:
   1. Relation of adjacent structure or materials.
   2. Field dimensions, clearly identified as such (not to be reviewed or verified by the Landscape Architect).
   3. Designations/Numbers of applicable standards [ASTM, UL, ANSI, for example].
   4. A blank space, 4" by 4" for the Landscape Architect's review stamp.
   5. Identification of all deviations from Contract Documents.
   6. Contractor's stamp, initialed or signed, certifying approval of submittal.
   7. Other pertinent data.

F. All submittals required by this Section shall be routed to:
   1. Prime Landscape Architecture
   2. 1524 West 3045 South
   3. Logan, Utah 84321

G. All submittals shall be made utilizing timely delivery, with capability for electronic tracking of each package, from drop-off to delivery.

1.11 LANDSCAPE ARCHITECT'S REVIEW PROCEDURE

A. The Landscape Architect will review submittals only for conformance with the design concept of the project and with information given in the Contract Documents.
   1. Errors and discrepancies observed during review of submittals will be noted, but checking will not include verification of dimensions or quantities.
   2. The Landscape Architect's review shall not relieve the Contractor from responsibility for errors or omissions in shop drawings or product data submittals or for lack of coordination in assembly of materials and equipment with other work, nor from the responsibility of furnishing materials and labor not indicated on reviewed shop drawings or product data, but required by the Contract Documents for completion of the work.

B. A digital stamp impression with the following "Submittal Review" stamp text will be affixed to specified required submittals, by the Landscape Architect.
   1. [ ] NO EXCEPTIONS TAKEN - Submittal has been reviewed and been found to be in general conformance. No resubmittal required.
   2. [ ] NOTE MARKINGS - Submittal has been reviewed with comments made on the submittal. No resubmittal required unless noted.
   3. [ ] REJECTED - Submittal has been reviewed and either the submittal itself, information contained in the submittal, or the product, material, or equipment being proposed has been found to be unsatisfactory. Submit new submittal, whether or not specifically indicated. No product, material, or equipment included in the submittal shall be provided until another submittal is made and found to be satisfactory.
   4. [ ] RESUBMIT - Contractor must revise as indicated and submit again
   5. [ ] COMMENTS ATTACHED - Additional comments are separately attached to the submittal or included with the return transmittal. However, failure of the Landscape Architect to mark this item shall not invalidate any comments thus attached.

C. The Landscape Architect will apply review stamp impression, and initials or signature certifying submittal review.

D. Submittals will be returned to Contractor for distribution.

1.12 RESUBMISSION REQUIREMENTS

A. Where indicated on Landscape Architect's review stamp, submittals must be re-submitted, as noted below, for further review and approval.

B. Shop Drawings:
   1. Revise initial drawings as required and resubmit as specified for initial submittal.
   2. Indicate on drawings any changes which have been made other than those required by Landscape Architect's markings.

C. Product Data and Samples:
   1. Submit new data and samples as required for initial submittal.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 4000

QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. Quality assurance.

C. Testing and inspection agencies and services. (contractor supplied)

D. Defect Assessment.

1.02 SUMMARY

A. Section provides for measures and services regarding quality control for various aspects of the project.

1.03 RELATED DOCUMENTS

A. The other Contract Documents complement this Section.

B. Division 1 – General Requirements govern this Section.

1.04 GENERAL

A. Employment of Testing Laboratory: The contractor shall be responsible for hiring and paying for the services of an independent third party testing laboratory.

B. Purpose: Service of a testing laboratory as specified in this section is intended for the Owner's verification of the Contractor's compliance with the requirements of the Contract. This is not intended to relieve the Contractor of responsibilities to provide his own inspection and quality control.

C. The Contractor shall reimburse the Owner for the cost of those services which, in the opinion of the Owner, are required because of the following:
   1. Failure of materials or workmanship to meet contract requirements.
   2. Materials or practices, not complying with the specifications which could possibly result in defective work thereby rendering it necessary or advisable to perform tests to determine whether or not work is acceptable.
   3. Changes in source, quality or characteristics of materials.
   4. Wasted time of inspectors because of cancellations or delays.
   5. Site cured cylinders requested by the Contractor.

1.05 RESPONSIBILITIES

A. Arrangement for and cooperate with laboratory personnel.

B. Provide access to the work and to manufacturers and fabricators facilities as required for the performance of their services.

C. Contractor Responsibilities: The Contractor will provide inspections, tests and similar quality control services specified to be performed by independent agencies and not by the Contractors propriate business. Costs for these services are to be included in the Contract Sum and not additional services.

D. Duties of the Testing Agency: The independent testing agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Landscape Architect and Contractor in performance of its duties, and shall service qualified personnel to perform required inspections and tests.

1. The agency shall notify the Landscape Architect and Contractor promptly of irregularities or deficiencies observed in the Work 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.
3. The agency shall not perform any duties of the Contractor.

E. Coordination: The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition, the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
   1. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

1.06 SUBMITTALS

A. Test Reports: After each test/inspection, promptly submit digital copies of report to Landscape Architect and to Contractor.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of test/inspection.
      h. Date of test/inspection.
      i. Results of test/inspection.
      j. Compliance with Contract Documents.
      k. When requested by Architect, provide interpretation of results.

1.07 QUALITY ASSURANCE

A. Testing Agency Qualifications:
   1. Engage inspection and testing agencies, including independent testing laboratories, which are prequalified as complying with Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.
      a. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the State in which the Project is located.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 TESTING AND INSPECTION

A. Tests required may include but not be limited to the following (all items listed here may not occur, see drawings and associated section of the specifications):
   1. Special Inspections including fabricators.
   2. Post Tensioning
   3. Soil Compaction
   2. Concrete
   3. Structural Masonry

B. It is recommended that the Contractor arrange for soils compaction and any other soils-related testing to be performed by or through the same firm throughout the overall project for consistency. There is no soils investigation data included with the project.

C. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Owner.

E. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.02 REPAIR AND PROTECTION

A. General: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes.
   1. Protect construction exposed by or for quality control service activities, and protect repaired construction.
   2. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

3.03 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

END OF SECTION

SECTION 01 4100

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY OF REFERENCE STANDARDS

A. Regulatory requirements applicable to this project are the following:

1. 29 CFR 1910 - Occupational Safety and Health Standards; current edition.
2. All Hyrum City requirements.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 4200

REFERENCES

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

1.02 SCHEDULE OF STANDARDS

A. General: Except as otherwise indicated, the Schedule of Standards contains:
   1. American Materials Association - AMA
   2. American Concrete Institute - ACI
   3. American Institute of Architects - AIA
   4. American Institute of Electrical Engineers - AIEE
   5. American Institute of Steel Construction - AISC
   6. American National Standards Institute - ANSI
   7. American Society of Mechanical Engineers - ASME
   8. American Society of Testing and Materials - ASTM
   9. American Welding Society - AWS
   10. Concrete Reinforcing Steel Institute - CRSI
   11. Federal Specifications - Fed. Spec.
   12. Manual of Accident Prevention in Construction
   13. Associated General Contractors of America - AGC
   14. National Board of Fire Underwriters - NBFO
   15. National Concrete Masonry Association - NCMA
   16. National Electric Code
   17. National Fire Protection Association - NFPA
   18. Occupational Safety and Health Act - OSHA
   19. Sheet Metal and Air Conditioning Contractors National Association, Inc. - SMACNA
   20. Steel Joist Institute - SJI
   21. Tile Council of American - TCI
   22. Underwriter's Laboratory - UL

1.03 STANDARDS AND DEFINITIONS

A. References to standards, codes, Specifications, recommendations and regulations refer to the latest edition or printing prior to the date of issue of the Contract Documents.

B. Applicable portions of standards listed that are not in conflict with Contract Documents are hereby made a part of the Specifications.

C. Modifications or exceptions to Standards shall be considered as amendments and unmodified portions shall remain in full effect. In cases of discrepancies between standards, the more stringent requirements shall govern.

D. Definitions: Basic Contract definitions are included in the General Conditions.
   1. Indicated refers to graphic representations, notes, or schedules on Drawings; Paragraphs or Schedules in Specifications; and similar requirements in Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help locate the reference.
   2. Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Landscape Architect," "requested by the Landscape Architect," and similar phrases.

3. Approve, used in conjunction with action on submittals, applications, and requests, is limited to the Landscape Architect's duties and responsibilities stated in General and Supplementary Conditions.
4. Regulation includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
5. Furnish means "supply and deliver, ready for unloading, unpacking, assembly, installation, and similar operations."
6. Install describes operations at the site including "unloading, unpacking, assembly, erection, anchoring, applying, working to dimension, protecting, cleaning, and similar operations."
7. Provide means "furnish and install, complete and ready for use."
8. Installer: "Installer" is the Contractor or an entity engaged by the Contractor as employee, subcontractor, or sub- subcontractor for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.
9. The term "experienced" when used with "Installer" means having a minimum of five (5) previous Projects similar in size to this Project and being familiar with the precautions required and with requirements of the authority having jurisdiction.
10. Project Site is the space available for construction activities, either exclusively or with others performing other construction on the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land upon which the Project is to be built.
11. Testing Laboratories: A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.
12. Language used in the Specifications is the abbreviated type. Implied words and meanings will be appropriately interpreted. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and where the context so indicates.
13. Imperative language is used generally. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.
14. The words "shall be" shall be included by inference wherever a colon (:) is used within a sentence or phrase.
15. Abbreviations and Names: Where acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards- generating organization, authority having jurisdiction, or other entity applicable. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.
16. Permits, Licenses, and Certificates: For the 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

SECTION 01 4219

REFERENCE STANDARDS

PART 1 GENERAL

1.01 QUALITY ASSURANCE

A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Should specified reference standards conflict with Contract Documents, request clarification from the Landscape Architect before proceeding.

C. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Landscape Architect shall be altered by Contract Documents by mention or inference otherwise in any reference document.

END OF SECTION

SECTION 01 5713

TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Prevention of erosion due to construction activities.

B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.

C. Restoration of areas eroded due to insufficient preventive measures.

D. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

END OF SECTION

SECTION 01 7000

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A.

1.02 QUALIFICATIONS

A. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Landscape Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

1.03 PROJECT CONDITIONS

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or mis-fabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Landscape Architect of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Landscape Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Landscape Architect.

F. Utilize recognized engineering survey practices.

G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations.

H. Periodically verify layouts by same means.

I. Maintain a complete and accurate log of control and survey work as it progresses.

3.04 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-complying work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

F. Restore work with new products in accordance with requirements of Contract Documents.

G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.

I. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.06 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.08 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.09 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

E. Clean filters of operating equipment.

F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.

G. Clean site; sweep paved areas, rake clean landscaped surfaces.

H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.10 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Landscape Architect when work is considered ready for Landscape Architect's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Landscape Architect's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Landscape Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Landscape Architect.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Landscape Architect when work is considered finally complete and ready for Landscape Architect's Substantial Completion final inspection.

H. Complete items of work determined by Landscape Architect listed in executed Certificate of Substantial Completion.

3.11 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 01 7329

CUTTING AND PATCHING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The other Contract Documents complement this Section.

B. Division 1 - General Requirements govern this Section.

1.02 SUMMARY OF WORK

A. This Section specifies cutting and patching of existing and previously installed construction.

1.03 DEFINITIONS

A. Cutting and Patching: The process of selective cutting and removal of limited areas of existing or new building materials to facilitate installation of new work, to uncover or remove existing elements (including patching openings left after removal of existing utility lines, equipment, etc.), or to achieve indicated design configurations, and the subsequent restoration of remaining adjacent construction to remain and as required to accommodate new work.

1.04 QUALITY ASSURANCE

A. Minimize the number of openings cut through existing work. Carefully layout work, and coordinate with other trades to combine openings as far as feasible.

B. Work to restore cut areas shall be performed only by trade workers experienced in installation of work similar to that to be patched.

C. Fire resistance Ratings: Where penetrations are to be cut or patched in fire resistance rated construction, perform work in a manner to maintain existing rating.

1. Patch openings or seal penetrations using materials and methods or as otherwise required to achieve an assembly listed by Underwriters Laboratories (UL) for required hourly rating.

1.05 COORDINATION

A. Coordinate cutting, fitting, and patching operations, including consequential excavation, backfill, and finishing required to complete work, with all affected trades, as required.

B. Coordinate cutting and patching work with Owner, when necessary, to minimize disruption of Owner's operations.

1.06 HAZARDOUS MATERIALS

A. To the best of the Owner's knowledge, the existing facility does not contain asbestos or lead-based coatings. If such materials, or other hazardous materials are encountered, cease operations that may disturb them, and contact the Owner for instructions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL

A. Perform cutting and patching as required for new work, whether or not specifically indicated on Drawings. Perform cutting and patching if required to expose, repair, or remove previously installed defective work. Under no condition shall the track be cut or patched.

3.02 PRECAUTIONS

A. Before cutting existing surfaces, examine surfaces and conditions under which cutting and patching is to be performed. Take precautionary action before proceeding if unsafe or unsatisfactory conditions are observed or encountered.

B. Avoid cutting existing pipe, conduit, or utilities until it is verified that they have been shut off, if to be abandoned, or bypassed if to remain active.

C. Do not cut or alter structural components.

D. Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.

1. Prior to proceeding, notify Owner of any proposed cutting and patching related to operational equipment or safety related systems.

E. Protection: Fully protect adjacent surfaces and equipment from damage due to cutting and patching operations.

F. If hazardous or toxic materials are encountered during cutting operations, cease work in the affected area and notify Owner immediately. Do not cut, alter, remove, or otherwise disturb such materials without Owner's written permission.

3.03 CUTTING

A. Areas of work to be cut and removed shall be held to the minimum required to install the new work, and shall be combined as much as possible to minimize the number of disrupted areas.

B. Under no condition shall the track be cut.

C. Cutting: Select cutting methods which will cause least damage to existing materials and surfaces to remain.

D. Generally, use hand and small power tools designed for sawing and grinding, rather than tools designed for hammering and chopping.

1. Cut openings neatly to sizes required, with minimum disturbance of adjacent surfaces, and in a manner to facilitate patching.

E. Cut or drill from exposed finish side into concealed spaces, to minimize disturbance to finished surfaces.

F. In masonry and tile surfaces, cut or chisel openings at mortar or grout joints and remove whole units where possible, unless otherwise indicated.

3.04 PATCHING

A. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

B. Patch surfaces with materials identical to those of adjacent surfaces. If identical materials are not available, us like materials to match as closely as possible.

C. When patching smooth finished surfaces, re-finish entire unbroken surface to nearest corner or other continuous break in plane.

1. Finish patched surfaces, Painting, or other applicable finish specifications for this project.

D. When patching masonry or tile surfaces, use materials of like size, color, surface texture, coursing, joint pattern, and other physical and visual characteristics.

END OF SECTION

SECTION 01 7700

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

B. Section 01 7839 “Project Record Drawings”

1.02 DESCRIPTION OF REQUIREMENTS

A. Definitions: Closeout is hereby defined to include general requirements near end of Contract Time, in preparation for final acceptance, final payment, normal termination of contract, occupancy by Owner and similar actions evidencing completion of the work. Specific requirements for individual units of work are specified in sections of the Project Manuel.

B. Submit Project Closeout Documents to Landscape Architect at time of Substantial Completion inspection unless otherwise noted.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 FINAL CLEANING

A. General: Special cleaning for specific units of work is specified in sections of Divisions 2 through 32. General cleaning during progress of work is specified in General Conditions. Provide final cleaning of the work, at time indicated, consisting of cleaning each surface or unit of work to normal "clean" condition expected for a first-class building cleaning and maintenance program. Comply with manufacturer's instructions for cleaning operations. The following are examples, but not by way of limitation, for cleaning levels required.

B. Remove labels which are not required as permanent labels.

C. Clean exposed exterior hard-surfaced finishes, to a dirt-free condition, free of dust, stains, films and similar noticeable distracting substances. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.

D. Clean light fixtures and lamps to function with full efficiency.

E. Clean project site (yard and grounds), including landscape development areas, of litter and foreign substances. Sweep paved areas to a broom-clean condition; remove stains, petrol-chemical spills and other foreign deposits. Rake grounds which are neither planted nor paved, to a smooth, even-textured surface.

F. Removal of Protection: Except as otherwise indicated or requested by Landscape Architect/Engineer, remove temporary protection devices and facilities which were installed during course of the work to protect previously completed work during remainder of construction period.

G. Compliances: Comply with safety standards and governing regulations for cleaning operations. Do not burn waste materials at site, or bury debris or excess materials on Owner's property, or discharge volatile or other harmful or dangerous material into drainage systems; remove waste materials from site and dispose of in a legal manner.

3.02 PRE-FINAL AND FINAL INSPECTIONS

A. The Contractor will prepare a written punch list of items to be completed or repaired and affixed to each area to be signed off by the affected subcontractor and Contractor prior to requesting a pre-final inspection by the Landscape Architect.

B. Upon Contractor's request, Landscape Architect (and his consultants as appropriate) will make a prefinal inspection and furnish to Contractor a list of items to be corrected by Contractor. Upon correction of these items, and receipt of written request that work is ready for final inspection, Landscape Architect will arrange a substantial completion inspection to include Owner's Representatives at which time Landscape Architect will furnish final list of items to be corrected. Landscape Architect will execute Certificate of Substantial Completion.

3.03 MAINTENANCE MANUALS

A. Organize maintenance and operating manual information into suitable sets of manageable size, and bind into individual binders properly identified and indexed (thumb-tabbed). Include emergency instructions, spare parts listing, extra stock receipts, copies of warranties, wiring diagrams, recommended "turn-around" cycles, inspection procedures, shop drawings, product data, and similar applicable information. Bind each manual of each set in a heavy-duty 2 inch, 3-ring vinyl covered binder, and include pocket folders for folded sheet information. Mark identification on both front and spine of each binder. Provide two (2) two hard copies and one (1) CD copy.

3.04 MANUFACTURER'S INSTRUCTIONS

A. Arrange, by appointment, to give physical demonstration and oral instructions for machine equipment operation to the Owner or his designated representative. Provide form stating instruction has been given. Form signed by Owner or his designated representative and by manufacturer's representative. Include in Maintenance Manuals.

3.05 WARRANTIES AND BONDS

A. When written, guarantees are required of any section of the work, Contractor shall secure such guarantees and/or warranties properly addressed and signed and in favor of Owner. These documents shall be delivered to Landscape Architect upon completion of Contractor's work and prior to final payment. Delivery of guarantees and warranties shall not relieve Contractor from any obligation assumed under any other provisions of his contract. Nothing herein intends or implies that guarantees and/or warranties shall apply to work abused or neglected by Owner.

3.06 PROJECT CLOSEOUT DOCUMENTS

A. Warranties, guarantees, certifications, and extra stock receipts required for project close-out include, but are not limited to, those shown on following schedule of Project Close-out Documents.

B. Deliver tools, spare parts, extra stocks of materials, and similar physical items to Owner.

C. Make final change-over of locks and transmit keys to Owner, an advise Owner's personnel of change-over in security provisions.

D. Complete start-up testing of systems, and instructions of Owner's operating/maintenance personnel. Discontinue (or change over) and remove from project site temporary facilities and services, along with construction tools and facilities, mock-ups, and similar elements.

E. Complete final cleaning up requirements, including touch-up painting of marred surfaces.

F. Submit final payment request with final releases supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

G. Submit final meter readings for utilities, measured record of stored fuel, and similar data as of time of substantial completion or when Owner took possession of and responsibility for corresponding elements of the work.

H. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, occupancy certificates, 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.

I. Revise and submit evidence of final, continuing insurance coverage complying with insurance requirements.

J. Submit the following closeout forms:
   1. Certificate of Substantial Completion
   2. Record Drawings/As-Built Survey Drawings
   3. Submit consent of surety
   4. Revise and submit evidence of final, continuing insurance coverage complying with insurance requirements
   5. Certificate of Substantial Completion
   6. Maintenance Manuals
   7. Contractor's One-year Guarantee
   8. Record Drawings

3.07 WARRANTIES, GUARANTEES, CERTIFICATIONS: (IF APPLICABLE)

A. Minimum one (1) year warranty from Date of Substantial completion and specified warranties as indicated in each specification section.

END OF SECTION

SECTION 01 7823

OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The other Contract Documents complement this Section.

B. Division 1 - General Requirements govern this Section.

1.02 SUMMARY

A. Section provides for that portion of the project close-out procedures whereby certain operating and maintenance data, information, manuals and instruction/training is provided to the Owner, in regard to future operation and maintenance of the facility and equipment.

1. Individual specification Sections have provisions requiring specific information manuals, direction, instruction, etc.

1.03 MANUALS

A. Purpose: Operation and maintenance manuals will be used for training of, and use by, Owner's personnel in operation and maintenance of systems and related equipment.

1. Refer to individual specification sections for systems and equipment for which manuals are required.

B. Format: Manuals shall be digital and organized.

C. Contents: Each Manual shall include:

1. Table of Contents.
2. Name, address, and phone number of manufacturer, installer, distributor, and authorized service provider(s).
3. Manufacturer’s product data or other description of system or equipment.
4. Opening sequence and procedures.
5. Safety instructions.
6. Wiring diagrams (as applicable).
7. Shop drawings (as applicable).
8. Maintenance instructions and requirements, including preventative and corrective maintenance.
9. Spare parts list.
10. Warranty copy.
11. Other information as required by individual specification sections and as appropriate to provide the Owner with necessary information regarding operation and maintenance of the system or equipment.

D. Less complex systems and equipment items may be organized into a single chapter within a manual containing several such items.

E. Copies: Unless otherwise indicated, provide three (3) copies of all manuals, with properly documented transmittal and digital version to Owner.

1.04 TRAINING

A. Contractor shall be responsible for having qualified representatives of equipment manufacturers train Owner's personnel in proper operation and maintenance of systems and equipment, as indicated in individual specification sections.

1. Training shall include on-the-job instruction and, if appropriate, shall include classroom instruction.

B. All required training shall be coordinated with, and scheduled at Owner's convenience.
   1. Arrange for suitable facility for training, if such is required.
   2. Provide minimum five (5) working days' notice to verify training time.

C. Training shall include start-up, operation, maintenance, shut-down, troubleshooting, and routine servicing of equipment and systems.

1.05 INSTRUCTIONS FOR MAINTENANCE OF SURFACES

A. Purposes: To instruct Owner's maintenance personnel in proper methods and materials to use in the proper care of all exposed surfaces.

B. Format: Provide individually bound or stapled documents for each different surface.
   1. Include a cover or cover sheet clearly indicating contents.
   2. If surface is a part of a system or equipment item for which an operating and maintenance manual is to be provided, include surface maintenance and cleaning information as a separate section within such manual.

C. Include recommended cleaning materials, preventative maintenance, and recommended methods and procedures for cleaning and otherwise maintaining surfaces.

D. Copies: Unless otherwise indicated, provide three (3) copies, with properly documented transmittal to Owner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 7836

WARRANTIES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The other Contract Documents complement this Section.

B. Division 1 - General Requirements govern this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers standard warranties on products and special warranties.

B. Related work specified elsewhere:
   1. Division 1 Section 01 7700 "Closeout Procedures" specifies contract closeout procedures.
   2. Divisions 2 through 16 Sections set out specific requirements for warranties on products and installations specified to be warranted.

C. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.

D. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products.
   1. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

E. Separate Prime Contracts: Each prime contractor is responsible for warranties related to its own contract.

1.03 DEFINITIONS

A. Standard Product Warranties: Preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special Warranties: Written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.04 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall extend, at a minimum, throughout the term of the original warranty.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or repair the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or repairing defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

D. Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.
   1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

E. Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, the Owner reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

1.05 SUBMITTALS

A. Submit written warranties to the Landscape Architect prior to the date certified for Substantial Completion.
   1. If the Landscape Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion of the project, or a designated portion of the Work, submit written warranties upon request of the Landscape Architect.
   2. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Landscape Architect upon Substantial Completion of that designated portion of the Work.

B. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties.
   1. Submit a draft to the Owner for approval prior to final execution.

C. Form of Submittal: At Final Completion compile six (6) copies of each required warranty properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer.
   1. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

D. Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
   1. Provide heavy paper index dividers with celluloid covered tabs for each separate warranty.
   2. Mark the tab to identify the product or installation.
   3. Provide a typed description of the product/r installation, including the name of the product, and the name, address, and telephone number of the Installer.
   4. Identify each binder on the front and spine with the typed or printed title "WARRANTIES", Project title or name, and name of the Contractor.
   5. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 7839

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

1.02 SUMMARY

A. Record documents and samples relating to this project are required, and shall be kept and prepared as required herein.

1.03 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Provide and maintain at the site, a full complement of project documents to be returned to the Owner at the completion of the project.

B. Designated and labeled as “RECORD DOCUMENTS,” maintain one (1) set of the following documents in good order; clean, dry, and legible condition:
   1. Complete set of Contract Drawings.
   2. Complete set of Contract Specifications (all volumes).
   3. All addenda, Change Orders and other modifications to the Contract, bound in a separate binder.
   4. Reviewed shop drawings, product data and samples, in files for ease of retrieval.

C. Label each document "Project Record" in neat, large printed letters.
   1. Do not use record documents for construction, or any other purposes.

D. Store all project record documents and samples, securely, in Contractor's field office apart from documents used for construction.
   1. Do not remove any record documents or samples from the field office, at any time, or for any purpose.
   2. Original copies of documents other than drawings and specifications shall be retained in Contractor’s main office.

1.04 RECORDING

A. Maintain current records by recording information concurrently with construction progress. Do not conceal any work until required information is recorded.
   1. Current record documents shall be made available for inspection by Owner upon one-day’s notice, throughout the course of the work.

B. Drawings and Specifications: Legibly marked to record all deviations to current contract documents showing actual construction.
   1. Whenever necessary to complete the record drawings in a neat, legible manner, Contractor shall employ a competent draftsman, satisfactory to Landscape Architect, to make new drawings or to indicate changes on the prints

C. At completion of project, submit marked-up record documents to Owner for review.

1.05 CERTIFICATION

A. Certify as a part of each application for payment that project record documents are current at time application is submitted. Include the requirements of recording paragraph above.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 7900

DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures; except:
   1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority.
   2. Submit one copy to the Commissioning Authority, not to be returned.
   3. Make commissioning submittals on time schedule specified by Commissioning Authority.
   4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of overall Training Plan; submit in editable electronic format, Microsoft Word 2023 version preferred.

1.03 QUALITY ASSURANCE

A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
   1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
   2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

END OF SECTION

SECTION 02 4119

SELECTIVE SITE DEMOLITION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SECTION INCLUDES

A. Demolition and removal of selected site elements.

B. Salvage of existing items to be reused or recycled.

1.03 RELATED SECTIONS

A. Division 01 7329 "Cutting and Patching" for cutting and patching procedures.

B. Division 31 2300 31 2300"Earthwork" for site clearing and removal of above- and below-grade improvements.

1.04 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.06 SUBMITTALS

A. Qualification Data: For demolition firm.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's other tenants' on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Locations of proposed dust and noise control, temporary partitions and means of egress, including for other tenants affected by selective demolition operations.
5. Coordination of Owner's continuing occupancy of portions of existing site and of Owner's partial occupancy of completed Work.
6. Means of protection for items to remain and items in path of waste removal from site.

C. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

D. Pre-demolition Photographs or Videotapes: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations.

E. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.07 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and NFPA 241

D. Pre-demolition Conference: Conduct conference at Project site. Review methods and procedures related to selective demolition including, but not limited to, the following:
   1. Inspect and discuss condition of construction to be selectively demolished.
   2. Review and finalize selective demolition and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
   3. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
   4. Review areas where existing construction is to remain and requires protection.

1.08 PROJECT CONDITIONS

A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
   1. Before selective demolition, Owner will remove the items to be salvaged by the owner. Coordinate other items with the architect.

B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
   1. Hazardous materials will be removed by Owner before start of the Work or have been removed by Owner under a separate contract.
   2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.

D. Storage or sale of removed items or materials on-site is not permitted.

E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
   1. Maintain fire-protection facilities in service during selective demolition operations.

1.09 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been shut off and ready to be capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs, preconstruction videotapes, and templates.

E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.02 UTILITY SERVICES

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
   1. Comply with requirements for existing services/systems interruptions specified in Division 01 Section "Summary."

B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and other systems serving areas to be selectively demolished.
   1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
   2. Arrange to shut off indicated utilities with the Owners staff.
   3. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems.

3.03 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of the site.
   2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces, to prevent water damage to critical areas.

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and items to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
   1. Strengthen or add new supports when required during progress of selective demolition.

D. No clearing, demolition, or removal of any kind shall proceed until all existing trees, improvements, etc. to be removed have been established and are inspected and documented by the Owner.

E. Establish necessary clearing limits within the construc-tion limits. Mark all trees, shrubs, structures, fences, concrete, and other improvements to be removed.

F. Within 10 feet of clearing limits, inspect, photograph with video tape, and record condition of concrete slabs, structures, landscaping and other features to remain

which might be affected by work. Allow Owner to view tape and approve prior to proceeding with the work.

G. Trees, shrubs and lawn, areas to receive planting, rock outcroppings, fences, sprinklers and other improvements that are not to be removed shall be protected from damage or injury. If damaged or removed, they shall be restored or replaced in as nearly the original condition and location as is reasonably possible. Trees, shrubs, and improvements not to be removed shall be marked in field by Owner and/or shown on the Drawings.

H. Give reasonable notice to Owner to permit him to salvage plants, trees, fences, sprinklers and other improvements within the con-struction limits that may be destroyed because of the work.

I. Notify interested utility companies to be present if disturbing ground in the vicinity of utilities.

J. Protect active utility systems adjacent to or uncovered by any excavation during site preparation.

K. Maintain benchmarks, monuments and other reference points and construction stakes.

L. Protect all improvements to remain or outside of con-struction from tree removal and/or pruning work.

3.04 CLEARING AND GRUBBING

A. Prior to any construction, remove unsuitable soils and vegetation from below foundations, floor slabs, exterior concrete flatwork, and asphalt concrete pavements and roads.

B. Branches of trees extending over the construction limits shall be trimmed to the boles to give a clear height of 20 feet above the existing ground surface. All trimming shall be done in accordance with recognized tree surgery standards. Remove additional tree branches under the direction of the Owner in such a manner that the tree will present a balanced appearance.

3.05 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Proceed with selective demolition systematically.
   2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
   3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   4. Do not use cutting torches until work area is cleared of flammable materials. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
   5. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
   6. Dispose of demolished items and materials promptly.

B. Removed and Salvaged Items:
   1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area on-site.
5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Landscape Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.06 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Topsoil:
1. Before any construction activity begins, remove topsoil and stockpile for re-use.
2. Topsoil shall be protected from contamination by weeds, debris, etc. and shall be replaced, graded and lightly compacted by Contractor at completion of project.

B. Concrete:
1. Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.
2. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
3. Concrete shall be removed to neatly sawed edges with saw cuts made to a minimum depth of 4 inches.
4. Concrete sidewalk or driveway to be removed shall be neatly sawed in straight lines either parallel to the curb or at right angles to the alignment of the sidewalk. No section to be replaced shall be smaller than 30 inches in either length or width.
5. Unless otherwise shown on the Drawings, if the sawcut would fall within 30 inches of a construc-tion joint, expansion joint, or edge, the concrete shall be removed to the joint or edge, except that where the saw cut would fall within 12 inches of a score mark, the saw cut shall be made in and along the score mark.
6. Curb and gutter to be removed shall be sawed to a depth of 1-1/2 inches on a neat line at right angles to the curb face.

C. Asphaltic Concrete Pavement:
1. Sawing shall be used to ensure the breakage of pavement along straight lines.
2. Dispose of asphalt pavement to be removed at a suitable offsite location in accordance with applicable laws and ordinances.

D. Fences and Miscellaneous Obstructions
1. No demolition or removal of fences or miscellaneous obstructions shall proceed until clearance is obtained from the Owner.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
   1. Do not allow demolished materials to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.08 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.09 SELECTIVE DEMOLITION SCHEDULE

A. Coordinate with design documentplans.

END OF SECTION

SECTION 03 3000

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Removal and replacement of existing concrete

B. Concrete reinforcement.

C. Runways and walk ways

D. Concrete curing.

E. Excavation, gravel, and backfill

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).

B. ACI 301 - Specifications for Structural Concrete; 2016.

D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).

E. ACI 305R - Guide to Hot Weather Concreting; 2010.

F. ACI 308R - Guide to External Curing of Concrete; 2016.

G. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2016.

H. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2016, with Editorial Revision (2016).

I. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2018.

J. ASTM C857 - Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures; 2016.

K. ASTM C858 - Standard Specification for Underground Precast Concrete Utility Structures; 2010.

L. ASTM C891 - Standard Practice for Installation of Underground Precast Concrete Utility Structures; 2011.

M. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2016.

N. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).

O. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2017a.

P. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2015.

1.04 SUBMITTALS

A. Mix Design: Submit proposed concrete mix design.
   1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.

B. Test Reports: Submit report for each test or series of tests specified.

PART 2 PRODUCTS

2.01 REINFORCEMENT MATERIALS

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).
   1. Type: Deformed billet-steel bars.

2.02 CONCRETE MATERIALS

A. Fine Aggregate: ASTM C33/C33M.
   1. Acquire aggregates for entire project from same source.
   2. Natural sand, manufactured sand, or combination thereof, washed and screened, consisting of hard durable uncoated particles free of deleterious matter and shall be so graded from course to fine as to produce minimum percentage of voids.
   3. Test fine aggregate for reactivity in presence of cement alkalis in accordance with ASTM C289

B. Course Aggregate: ASTM C33/C33M.
   1. Acquire aggregates for entire project from same source.
   2. Normal Weight Aggregate: ASTM C33/C33M, gravel or crushed stone suitably washed and screened, and shall consist of hard, durable particles without adherent coatings.
   3. Lightweight Aggregate: ASTM C330/C330M, suitably processed, washed and screened, and shall consist of durable particles without adherent coatings.

C. Fly Ash: ASTM C618, Class C or F.

D. Precast Concrete Catch Basins: ASTM C858 precast reinforced concrete, designed according to ASTM C857 for structural loading.

2.03 ADMIXTURES

A. Chemical Admixture: ASTM C260/C260M

B. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

C. Air Entrainment Admixture: ASTM C260/C260M.

2.04 CURING MATERIALS

A. No curing or Hardening Agents: No curing agents, sealers, or hardener shall be used to aid in curing of concrete. If present these compounds must be removed by shot blasting or scarifying prior to installation of synthetic surface. Chemical curing agents, sealer, or hardeners may have an adverse effect on the adhesion of the synthetic track surface to the concrete base.

2.05 CONCRETE MIX DESIGN

A. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.

B. Normal Weight Concrete:
   1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 4,000 pounds per square inch (27.6 MPa), 6 bag mix.
   2. Fly Ash Content: Maximum 20 percent of cementitious materials by weight.
   3. Water-Cement Ratio: Maximum 0.45 at point of placement.
   4. Total Air Content: 5.5 to 7.5 percent for 3/4 inch (19 mm) max aggregate, determined in accordance with ASTM C173/C173M.
   5. Maximum Slump: 3-1/2 inches (89 mm) at point of placement.
   6. No water shall be added at job site.

PART 3 EXECUTION

3.01 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

A. Accurately position and support reinforcement, and secure against displacement.

3.02 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place 4" minimum concrete over 4 inches of ¾ inch crushed aggregate base course.

C. Locate and install contraction, construction, isolation, and expansion joints as indicated or required.

D. Place concrete in a continuous operation within planned joints or sections. Do not add water to adjust slump.

E. Place pre-cast concrete catch basin as indicated and install according to ASTM C891. Connect to existing drainage system if any. Verify existing conditions and report findings to architect.

3.03 CONCRETE FINISHING

A. Float surfaces to true planes within a tolerance of 1/4 inch in 10 feet (1:480) and medium-to-fine-textured broom finish.

B. Tool edges and joints to a radius of 1/4 inch (6 mm)

3.04 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3.05 FIELD QUALITY CONTROL

A. Contractor will employ a testing agency to sample concrete, perform tests, and submit test reports during concrete placement. Every 3rd concrete truck shall be tested.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

3.06 DEFECTIVE CONCRETE

A. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.

B. Repair or replacement of defective concrete will be determined by the Landscape Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Landscape Architect for each individual area.

3.07 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface for at least 14 days.

B. Hot Weather: ACI 305R

1. Reduce temperature of mix ingredients or use an admixture appropriate to job conditions when air temperature is over 75 deg. F.

END OF SECTION

SECTION 31 0700

GENERAL SITE CONSTRUCTION REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. General procedures and requirements for Site Work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PREPARATION

A. Site Verification of Conditions
   1. 48 hours minimum prior to performing any work on site, contact Blue Stakes to arrange for utility location services.
   2. Perform minor, investigative excavations to verify location of various existing underground facilities at sufficient locations to assure that no conflict with the proposed work exists and sufficient clearance is available to avoid damage to existing facilities.
   3. Perform investigative excavating five (5) days minimum in advance of performing any excavation or underground work.
   4. Upon discovery of conflicts or problems with existing facilities, notify Landscape Architect by phone within 24 hours. Follow telephone notification with letter and diagrams indicating conflict or problem and sufficient measurements and details to evaluate problem.
   5. Notify Owner of utilities work a minimum of 48 hours prior to any work taking place.
   6. Provide Utility Locator Service for all areas identified within Construction Limits. Review results with Landscape Architect, Engineer and Owner prior to beginning any construction

3.02 INSTALLATION

A. Protection
   1. Spillage
      a. Avoid spillage by covering and securing loads when hauling on or adjacent to public streets or highways.
      b. Remove spillage and sweep, wash, or otherwise clean project, streets, and highways.
   2. Dust Control
      a. Take precautions necessary to prevent dust nuisance, both on-site and adjacent to public and private properties.
      b. Correct or repair damage caused by dust.
   3. Erosion Control
      a. Take precautions necessary to prevent erosion and transportation of soil downstream, to adjacent properties, and into on-site or off-site drainage systems.
      b. Develop, install, and maintain an erosion control plan, if required by law.
      c. Repair and correct damage caused by erosion.
   4. Existing Plants and Features
      a. Do not damage tops, trunks, or roots of existing trees and shrubs on site which are intended to remain.

b. Do not use heavy equipment within branch spread. Interfering branches may be removed only with permission of Landscape Architect.
c. Do not damage other plants and features which are to remain.

5. Protect site from fire caused by welding, cutting, smoking, or other sources of ignition.

B. If specified precautions are not taken, or corrections and repairs made promptly, Owner may take such steps as may be deemed necessary, and deduct costs of such from monies due to Contractor. Such action, or lack of action, on Owner's part does not relieve Contractor from responsibility for proper protection of the Work.

C. Fees

1. Contractor shall be responsible for all off-site street cut fees, encroachment permit fees, and bonding associated with the construction of the proposed facility.

3.03 REPAIR / RESTORATION

A. Adjust existing covers, boxes, and vaults to grade.

B. Replace broken or damaged covers, boxes, and vaults.

C. Independently confirm size, location, and number of covers, boxes, and vaults which require adjustment.

3.04 FIELD QUALITY CONTROL

A. Notify Landscape Architect 48 hours prior to performing excavation or fill work.

B. If work has been interrupted by weather, scheduling, or other reason, notify Landscape Architect 24 hours minimum prior to intended resumption of grading or compacting.

C. Owner reserves right to require additional testing to re-affirm suitability of completed work including compacted soils which have been exposed to adverse weather conditions.

END OF SECTION

SECTION 31 1000

SITE CLEARING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Clearing and protection of vegetation.

B. Clearing and grubbing.

C. Stripping and stockpiling topsoil.

D. Removing above- and below- grade site improvements.

E. Temporary erosion and sedimentation control measures.

F. Removal of existing debris.

1.02 RELATED REQUIREMENTS

A. Section 31 2200 - Grading: Topsoil removal.

B. Section 31 2200 - Grading: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.03 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.

1.04 MATERIAL OWNERSHIP

A. Except for stripped topsoil or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.05 SUBMITTALS

A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

B. Site Plan: Showing:

1. Areas for temporary construction and field offices.

C. Record drawings, according to Section 01 7839 Project Record Documents, identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.06 QUALITY ASSURANCE

A. Pre-installation Conference: Conduct conference at Project site with owner weekly and to comply with requirements in Section 01 7823

1.07 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
   1. Do not proceed with work on adjoining property until directed by Architect.

C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

D. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

E. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

A. Satisfactory Soil Material: As specified in Section 31 2300 - Earthwork
   1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 EXECUTION

3.01 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Protect existing site improvements to remain from damage during construction.
   1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.02 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction, sediment and erosion control Drawings, a sediment and erosion control plan, specific to the site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.03 SITE CLEARING AND GRUBBING

A. Remove obstructions, grass, and other vegetation to permit installation of new construction.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
   1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches and compact each layer to a density equal to adjacent original ground.

3.04 EXISTING UTILITIES AND BUILT ELEMENTS

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
   1. Owner will arrange to shut off indicated utilities when requested by Contractor.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

1. Notify Owner not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner's written permission.

D. Protect existing structures and other elements that are not to be removed.

3.05 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
   1. Remove subsoil and non-soil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   1. Limit height of topsoil stockpiles to 120 inches.
   2. Dispose of excess topsoil as specified for waste material disposal.
   3. Stockpile surplus topsoil to allow for re-spreading deeper topsoil.

3.06 VEGETATION

A. Do not remove or damage vegetation beyond the limits indicated on drawings.

B. Install substantial, highly visible fences at least 3 feet (1 m) high to prevent inadvertent damage to vegetation to remain:
   1. At vegetation removal limits.

C. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum disturbance of the subsoil.

D. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated.
   1. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.
   2. Trees: Sell if marketable; if not, treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches (450 mm).
   3. Sod: Re-use on site if possible; otherwise sell if marketable, and if not, treat as specified for other vegetation removed.

E. Restoration: If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to Owner.

3.07 SITE IMPROVEMENTS

A. Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction. Refer to project plans for improvements to be abandoned in place.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
   1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
   2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

3.08 DEBRIS

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

3.09 DISPOSAL

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
   1. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

END OF SECTION

SECTION 31 2300

EARTHWORK

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:
   1. Preparing subgrades for slabs-on-grade, walks, pavements, lawns, and plantings.
   2. Excavating and backfilling for buildings and structures.
   3. Drainage course for slabs-on-grade.
   4. Subbase course for concrete walks and pavements.
   5. Base course for asphalt paving.
   6. Subsurface drainage backfill for walls and trenches.
   7. Excavating and backfilling trenches within building lines.
   8. Excavating and backfilling trenches for buried mechanical and electrical utilities and pits for buried utility structures.

B. Related Sections include the following:
   1. Division 2 Section 02 4119 "Selective Site Demolition" for temporary controls and site stripping, grubbing, removing topsoil, and protecting trees to remain.

1.03 DEFINITIONS

A. Backfill: Soil materials used to fill an excavation.
   1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
   2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Layer placed between the subbase course and asphalt paving.

C. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Layer supporting slab-on-grade used to minimize capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations.
   1. Bulk Excavation: Excavations more than 10 feet (3 m) in width and pits more than 30 feet (9 m) in either length or width.
   2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. Subbase Course: Layer placed between the subgrade and base course for asphalt paving, or layer placed between the subgrade and a concrete pavement or walk.

J. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

K. Utilities: Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.04 SUBMITTALS

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
   1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
   2. Laboratory compaction curve according to ASTM D 1557 for each on-site or borrow soil material proposed for fill and backfill.

1.05 PROJECT CONDITIONS

A. No additional monies for exporting or importing of soil.
   1. As part of the Construction Documents, Owner may have provided Contractor with a Topographic Survey performed by manual or aerial means. Such Survey was prepared for project design purposes and is provided to the Contractor as a courtesy. It is expressly understood that such survey may not accurately reflect existing topographical conditions and typically will vary from actual conditions by a significant degree. It is the Contractor's responsibility to verify actual existing conditions by whatever means the Contractor deems appropriate. The Contractor shall be responsible for determining their own earthwork quantities and not rely on any estimate prepared by the Owner, its Agents or outside parties. The Contractor is responsible as part of its lump sum bid price for the project, for importing or exporting soils to achieve final sub-grades with suitable soils per the plans and specifications. No additional monies will be allowed beyond the Contractor's Lump Sum Bid Price for the project, for the exporting or importing of soils.

B. Existing Utilities: Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.
   1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
   2. Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated:
   3. Notify Architect not less than seven (7) days in advance of proposed utility interruptions.
   4. Do not proceed with utility interruptions without Architect's written permission.
   5. Contact utility-locator service for area where Project is located before excavating.

C. Utilities to be removed: Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

D. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.
   1. Operate warning lights as recommended by authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 4 inches (100 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.
   1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Backfill and Fill: Satisfactory soil materials.

E. Subbase: Naturally or artificially well graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 70 percent passing a 3/4- inch (18-mm) sieve and not more than 25 percent passing a No. 200 (0.075-mm) sieve.

F. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; conforming to the 1 inch gradation requirements of Section 301 of the UDOT Standard Specification for Road and Bridge Construction.

G. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 70 percent passing a 3/4-inch (18-mm) sieve and not more than 25 percent passing a No. 200 (0.075-mm) sieve.

H. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

I. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch (38-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

J. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.

K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.02 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility; colored as follows:

B. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:
   1. Red: Electric.
   2. Yellow: Gas, oil, steam, and dangerous materials.
   3. Orange: Telephone and other communications.

4. Blue: Water systems.
5. Green: Sewer systems.

C. Trace Wire: Insulated 10 gage copper, suitable for direct bury.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.02 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
   1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
   2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.03 EXPLOSIVES - NOT ALLOWED

3.04 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.
   1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.05 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.1 FT (25 mm). Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
   1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. If required to not disturb bottom of excavation, excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
   2. Excavation for Underground Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 0.1 FT (25 mm). Do not disturb bottom of excavations intended for bearing surface.

3.06 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.

3.07 EXCAVATION FOR UTILITY TRENCHES

A. Trench Excavation: Excavate trenches to indicated gradients, lines, depths, and elevations.
   1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
   2. Trench Clearance: Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit, unless otherwise indicated.
   3. Clearance: 12 inches (300 mm) on each side of pipe or conduit.

B. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
   1. For pipes and conduit less than 6 inches (150 mm) in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
   2. For pipes and conduit 6 inches (150 mm) or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
   3. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

C. Trench Bottoms: Excavate trenches 4 inches (100 mm) deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe.
   1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.08 TRENCH SUPPORT SYSTEMS

A. Trench support system shall be suitable for the soil structure, depth of cut, water content of soil, weather conditions, superimposed loads and vibration. Contractor may select one of the following methods of ensuring the safety of workers in the trench, as approved by the Utah State Industrial Commission or its safety inspectors:
   1. Sloping the sides of the trench to the angle of repose at which the soil will remain safely at rest.
   2. Shoring trench sides by placing sheeting, timber shores, trench jacks, bracing, piles, or other materials to resist pressures surrounding the excavation.
   3. Using a movable trench box built-up of steel plates and heavy steel frame of sufficient strength to resist the pressures surrounding the excavation

3.09 APPROVAL OF SUBGRADE

A. Notify Architect when excavations have reached required subgrade.

B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof roll subgrade with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect.

3.10 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Architect.
   1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

3.11 STORAGE OF SOIL MATERIALS

A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.12 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:
   1. Construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
   2. Surveying locations of underground utilities for record documents.
   3. Inspecting and testing underground utilities.
   4. Removing concrete formwork.
   5. Removing trash and debris.
   6. Removing temporary shoring and bracing, and sheeting.
   7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.13 UTILITY TRENCH BACKFILL

A. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

B. Backfill trenches excavated under footings and within 18 inches (450 mm) of bottom of footings; fill with concrete to elevation of bottom of footings.

C. Provide 4-inch- (100-mm-) thick, concrete-base slab support for piping or conduit less than 30 inches (750 mm) below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches (100 mm) of concrete before backfilling or placing roadway subbase.

D. Place and compact initial backfill of subbase material, free of particles larger than 1 inch (25 mm), to a height of 12 inches (300 mm) over the utility pipe or conduit.
   1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.

E. Coordinate backfilling with utilities testing.

F. Place and compact final backfill of satisfactory soil material to final subgrade.

G. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.14 FILL

A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.

B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

C. Place and compact fill material in layers to required elevations as follows:
   1. Under grass and planted areas, use satisfactory soil material.
   2. Under walks and pavements, use satisfactory soil material.
   3. Under steps and ramps, use engineered fill.
   4. Under building slabs, use engineered fill.
   5. Under footings and foundations, use engineered fill.

3.15 MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.
   1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
   2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.16 COMPACTION OF BACKFILLS AND FILLS

A. Place backfill and fill materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
   1. Under structures, building slabs, steps, and pavements, scarify and recompact top 6 inches (150 mm) of existing subgrade and each layer of backfill or fill material at 95 percent. Compact to 98 percent for fills thicker than 6 feet deep.
   2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 95 percent.
   3. Under lawn or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 90 percent.

3.17 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
   1. Provide a smooth transition between adjacent existing grades and new grades.
   2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
   1. Lawn or Unpaved Areas: Plus or minus 0.2 FT (25 mm).
   2. Walks: Plus or minus 0.1 FT (13 mm).
   3. Pavements: Plus or minus 0.1 FT (13 mm).

C. Grading inside Building Lines: Finish subgrade to a tolerance of 0.1 FT (13 mm) when tested with a 10-foot (3-m) straightedge.

3.18 SUBBASE AND BASE COURSES

A. Under pavements and walks, place subbase course on prepared subgrade and as follows:

1. Place base course material over subbase.
2. Compact subbase and base courses at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.
3. Shape subbase and base to required crown elevations and cross-slope grades.
4. When thickness of compacted subbase or base course is 6 inches (150 mm) or less, place materials in a single layer.
5. When thickness of compacted subbase or base course exceeds 6 inches (150 mm), place materials in equal layers, with no layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick when compacted.

B. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders, at least 12 inches (300 mm) wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.19 DRAINAGE COURSE

A. Under slabs-on-grade, place drainage course on prepared subgrade and as follows:
1. Compact drainage course to required cross sections and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.
2. When compacted thickness of drainage course is 6 inches (150 mm) or less, place materials in a single layer.
3. When compacted thickness of drainage course exceeds 6 inches (150 mm), place materials in equal layers, with no layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick when compacted.

3.20 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 1000 sq. ft. (186 sq. m) or less of paved area or building slab, but in no case fewer than three tests.
2. Foundation Wall/Continuous Footing Backfill: At each compacted backfill layer, at least one test for each 15 linear feet or less of wall length, but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 40 feet or less of trench length, but no fewer than two tests.
4. Spot Footings: Minimum of 1 compaction test for each lift for each spot footing.
5. Sidewalks, Curbs, Gutters, Pads: Minimum of 1 test for each lift for each 40 lineal feet or 1 test for every 1000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.21 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
   1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
   1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION

SECTION 31 2316

EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavating for paving and site structures.

1.02 DEFINITIONS

A. Unsuitable material: Debris and/or soil material judged unsuitable by Engineer for support of slabs or other site improvements.

B. Engineer: Third party Soils Engineer employed by Contractor, empowered to conduct inspections and make approvals.

1.03 REFERENCE STANDARDS

A. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)); 2012, with Editorial Revision (2015).

1.04 JOB CONDITIONS

A. Protect existing facilities, utilities (overhead and underground), sidewalks, pavement.
   1. Repair damaged items.
   2. Notify Owner and make emergency repair as directed.

B. Protect graded areas against erosion.
   1. Re-establish grade where settlement or washing occurs at no extra cost.

1.05 QUALITY ASSURANCE

A. Compaction density test: modified proctor, ASTM D1557

B. Layout work by Surveyor or Civil Engineer registered in the State of Utah. Identify benchmark to be used in establishing grades.

C. Contractor shall hire an independent soils laboratory to conduct in place moisture and density tests.

D. Tolerances of sub-grade:
   1. Unsurfaced areas: Plus/minus 0.20 FT from required elevations.
   2. Paved areas: Plus/minus 0.10 FT from required elevations.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fill materials:
   1. Reasonably free of roots, organic material, trash, frozen matter, and stones larger than 6 inches.
   2. Add water to dry material, as required.
   3. Allow wet material to dry, as required.
   4. Fill can only be obtained on site where removed from excavating and grading.
   5. Provide additional off-site borrow or fill as required.

B. Remove surplus material from site.

PART 3 EXECUTION

3.01 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. Layout units, structures, piping, roads, parking areas and walks and establish their elevations.

C. Perform other layout work required.

D. Locate, identify, and protect utilities that remain and protect from damage.

E. Grade top perimeter of excavation to prevent surface water from draining into excavation. Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by Landscape Architect.

F. Preparation for embankments and fills:
   1. Remove topsoil over areas to be cut and filled that was not previously removed by stripping and grubbing.
   2. Remove all unconsolidated fill.
   3. Before fill is started, scarify to a minimum depth of 6 inches under new roads, parking lots, or streets.
   4. Bring to optimum moisture content.
   5. Compact to a minimum 95 percent.
   6. In areas where existing ground surface is steeper than one vertical to four horizontal, bench surface in order to spread fill horizontally so that fill material will bond with existing surface.

3.02 EXCAVATING

A. Excavate to accommodate new structures and construction operations
   1. Excavate to the specified elevations.
   2. Excavate and grade site to subgrades of paved and unpaved areas as indicated.
   3. Excavate for miscellaneous footings, slabs, walks, and other structures.

B. Notify Landscape Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

C. Cut and fill as required to bring existing grades to rough grades.

D. Furnish and place additional approved material required to bring subgrade to proper line and grade.

E. Provide temporary means and methods, as required, to remove all water from excavations until directed by Landscape Architect. Remove and replace soils deemed suitable by classification and which are excessively moist due to lack of dewatering or surface water control.
   1. Maintain ditches and drains to provide drainage.
   2. Provide pumping if required.

F. Remove unsuitable materials which cannot be compacted as specified and replace with suitable material.
   1. Dispose material on site as directed.
   2. Dispose material off site as directed.

G. Remove materials unsuitable to receive fill and replace with suitable material.

3.03 CONSTRUCTION OF EMBANKMENTS AND FILLS

A. Do not fill or backfill until all debris, water, unsatisfactory soil materials, obstructions, and deleterious materials have been removed from excavation.

B. Construct embankments and fills to lines and grades.

C. Make completed fill correspond to shape of typical cross section or contour indicated regardless of method used to indicate shape, size, and extent of line and grade of work.

D. Insure that cobbles larger than 4 inches are not placed in upper 6 inches of fill or embankment.

E. Place material in lifts, maximum 8 inch loose thickness.

F. Place layers horizontally and compact each layer to specified density prior to placing additional fill.

G. Compact using suitable equipment.
   1. Control moisture to meet requirements of compaction.
   2. Place materials within 3 percent above to 3 percent below optimum moisture content.

H. Under roadways and parking areas and extending 1 ft beyond proposed curb line measured perpendicular from centerline, compact to 95 percent maximum dry density.

I. Under walk paving, compact to 95 percent maximum dry density.

J. For other embankments and fills not listed, compact to 90 percent of maximum dry density.

END OF SECTION

SECTION 31 2500

EROSION CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. This Section covers the work required for erosion control during construction. Any local or State Agency requirements shall be followed as part of these specifications.

B. Obtain the National Pollution Discharge Elimination System (NPDES) Permit for storm water discharge associated with construction activity.

C. Obtain a UPDES Storm Water General Permit for Construction Activities or an alternate individual permit as required by local jurisdiction. Applications are available online at www.waterquality.utah.gov/UPDES/stormwater.

PART 2 PRODUCTS

2.01 SILT FENCE

A. Silt fence shall be a woven fabric that meets the following criteria:

Property	Unit	Test Method	Values
Grab Strength	lbs	ASTM D4632/D4632M	90 min
Grab Elongation	%	ASTM D4632/D4632M	40 max
Water Flow Rate	gal/min/ft2	ASTM D4491	15 min
Ultraviolet Stability	%	ASTM D4355/D4355M	70% min

PART 3 EXECUTION

3.01 EXECUTION

A. Silt fence shall be placed in accordance with plans and details. The placement of silt fence and/or bales shall consider drainage paths and intercept drainage prior to leaving the site or entering a storm sewer system. Removal of silt and replacement of silt fence and/or bales shall be on going through the duration of the project to maintain an effective silt removing barrier.

B. Sediment Basin and/or sinks shall be constructed to dimensions shown on the plans. The basins and/or sinks shall be cleaned as required to maintain specified size and depth.

C. All temporary grading of drainage channels, slopes or fills shall be in accordance with Division 31 2300 Earthwork.

END OF SECTION

SECTION 32 1216

ASPHALT PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cold milling of existing hot-mix asphalt pavement.

B. Hot-mix asphalt paving.

C. Asphalt surface treatments.

D. Pavement-marking paint.

E. Single course bituminous concrete paving.

F. Surface sealer.

1.02 RELATED REQUIREMENTS

A. Section 02 4119 - Selective Site Demolition: for demolition, removal, and recycling of existing asphalt pavements, and for geotextiles that are not embedded within courses of asphalt paving.

B. Section 09 9113 - Exterior Painting: Pavement markings.

C. Section 31 2000 - Earth Moving: for aggregate subbase and base courses and for aggregate pavement shoulders.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 01 2200 - Unit Prices for requirements applicable to this section.

B. Seal Coat: By the square yard (meter). Includes preparing surfaces and applying.

1.04 DEFINITIONS

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D8 for definitions of terms.

1.05 REFERENCE STANDARDS

A. AASHTO M 140 - Standard Specification for Emulsified Asphalt; Current Edition.

B. AASHTO M 17 - Specification for Mineral Filler for Bituminous Paving Mixtures; Current Edition.

C. AASHTO M 208 - Standard Specification for Cationic Emulsified Asphalt; Current Edition.

D. AASHTO M 247 - Standard Specification for Glass Beads Used in Traffic Paints; Current Edition.

E. AASHTO M 248 - Standard Specification for Ready-Mixed White and Yellow Traffic Paints; Current Edition.

F. AASHTO M 288 - Standard Specification for Geosynthetic Specification for Highway Applications; 2017.

G. AASHTO M 29 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures; Current Edition.

H. AASHTO M 324 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements; 2012 Edition.

I. AASHTO T 168 - Standard Method of Test for Sampling Bituminous Paving Mixtures; Current Edition.

J. AASHTO T 245 - Standard Method of Test for Resistance to Plastic Flow of Asphalt Mixtures Using Marshall Apparatus; Current Edition.

K. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types; 2015.

L. ASTM D1073 - Standard Specification for Fine Aggregate for Asphalt Paving Mixtures; 2016.

M. ASTM D1188 - Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples; Current Edition.

N. ASTM D2041/D2041M - Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures; 2011.

O. ASTM D2397/D2397M - Standard Specification for Cationic Emulsified Asphalt; Current Edition.

P. ASTM D242/D242M - Standard Specification for Mineral Filler for Bituminous Paving Mixtures; Current Edition.

Q. ASTM D2726/2726M - Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Asphalt Mixtures; Current Edition.

R. ASTM D2950/D2950M - Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods; Current Edition.

S. ASTM D3141/D3141M - Standard Specification for Asphalt for Undersealing Portland-Cement Concrete Pavements; Current Edition.

T. ASTM D3381/D3381M - Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction; 2013.

U. ASTM D3549/D3549M - Standard Test Method for Thickness or Height of Compacted Asphalt Mixture Specimens; Current Edition.

V. ASTM D3910 - Standard Practices for Design, Testing, and Construction of Slurry Seal; Current Edition.

W. ASTM D5581 - Standard Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus; Current Edition.

X. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements; Current Edition.

Y. ASTM D692/D692M - Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures; 2015.

Z. ASTM D6927 - Standard Test Method for Marshall Stability and Flow of Asphalt Mixtures; Current Edition.

AA. ASTM D8 - Standard Terminology Relating to Materials for Roads and Pavements; Current Edition.

AB. ASTM D977 - Standard Specification for Emulsified Asphalt; Current Edition.

AC. ASTM D979 - Standard Practice for Sampling Bituminous Paving Mixtures; Current Edition.

AD. FS TT-P-1952 - Paint, Traffic Black, and Airfield Marking, Waterborne; 2015f.

1.06 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
   1. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
   2. Job-Mix Designs: For each job mix proposed for the Work.

B. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

C. Samples: For each paving fabric, 12 by 12 inches minimum if used.

D. Samples for Verification: For the following products, in manufacturer's standard sizes unless otherwise indicated:
   1. Each paving fabric, 12 by 12 inches minimum.
   2. Each type and color of preformed traffic-calming device.
   3. Each pattern and color of imprinted asphalt and precut marking material.

E. Qualification Data: For qualified manufacturer and Installer.

F. Material Certificates: For each paving material, from manufacturer.

G. Material Test Reports: For each paving material.

H. Fire Marshal Approval: For the striping plan as it relates to fire lanes and the marking thereof.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide copy of manufactures experience for verification of qualifications.

B. Installer Qualifications: Imprinted-asphalt manufacturer's authorized installer who is trained and approved for installation of imprinted asphalt required for this Project.

C. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

D. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of city and DOT for asphalt paving work.
   1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

E. Pre-installation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:
      a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
      b. Review condition of subgrade and preparatory work.
      c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
      d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

F. Obtain materials from same source throughout.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.09 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
   1. Prime Coat: Minimum surface temperature of 60 deg F. Not used if paving takes place within 48 hours of final grading and final compaction of road base.
   2. Tack Coat: Minimum surface temperature of 60 deg F.
   3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
   4. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
   5. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials 55 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 PRODUCTS

2.01 MATERIALS

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Aggregate for Base Course : ASTM D692/D692M, sound, angular crushedN/A stone, crushed gravel, or cured, crushed blast-furnace slag, free of shale, clay, friable material and debris.

C. Fine Aggregate: ASTM D1073 or AASHTO M 29, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.
   1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

D. Mineral Filler: ASTM D242/D242M or AASHTO M 17, rock or slag dust, hydraulic cement, or other inert material.

E. Asphalt Cement: AC 20 per ASTM D3381/D3381M for viscosity-graded material except use ductility at 39.2 deg. F., >5 for AC 20 and delete the loss on heating requirement on residue from “Thin-Film Oven Test”.

F. Primer Coat: Not required if paving is done within 48 hours of final compaction.

G. Tack Coat: ASTM D977 or AASHTO M 140 emulsified asphalt, or ASTM D2397/D2397M or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

H. Fog Seal: ASTM D977 or AASHTO M 140 emulsified asphalt, or ASTM D2397/D2397M or AASHTO M 208 cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application.

I. Water: Potable

J. Undersealing Asphalt: ASTM D3141/D3141M, pumping consistency.

K. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.

L. Sand: ASTM D1073 or AASHTO M 29, Grade Nos. 2 or 3.

M. Paving Geotextile: AASHTO M 288, nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.

N. Joint Sealant: ASTM D6690 or AASHTO M 324, Type I Type II or III Type IV, hot-applied, single-component, polymer-modified bituminous sealant.

O. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248, Type N, Type F, and Type S; colors complying with FS TT-P-1952.
   1. Color: White, Yellow, Blue, and As indicated.

P. Glass Beads: AASHTO M 247, Type 1.

Q. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, 4-1/2 inches high by 9 inches wide by 72 inches. Provide chamfered corners, drainage slots on underside, and holes for anchoring to substrate.
   1. Dowels: Galvanized steel, 3/4-inch diameter, 20-inch minimum length.

2.02 ASPHALT PAVING MIXES AND MIX DESIGN

A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction; designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types"; and complying with the following requirements:
   1. Provide mixes with a history of satisfactory performance in geographical area where Project is located. Provide mix with the following characteristics:
      a. Number of compaction blows each end of specimen: 50.
      b. Satiability based on ASTM D5581: 1200 minimum.
      c. Flow in 0.01-inch units per ASTM D5581: 10-18.
      d. Voids in mineral aggregate VMA: 14.
      e. The percentage of bituminous material by weight added to aggregate will be between 4% and 7% of the weight of the bituminous mixture.
   2. Surface Course: 3-inch minimum compacted thickness and as indicated on the drawings with aggregate meeting a ½" gradation – APWA 2012 Utah Chapter Specification.

B. Emulsified-Asphalt Slurry: ASTM D3910, Type 1.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.

B. Verify that the road base has been properly compacted and is at the correct line, grade, and slope.

C. Verify that the road base thickness is as indicated on the project plans.

D. Verify gradients and elevations of base are correct.

E. Proceed with paving only after unsatisfactory conditions have been corrected.

F. Verify that utilities, traffic loop detectors, and other items requiring a cut and installation beneath the asphalt surface have been completed and that asphalt surface has been repaired flush with adjacent asphalt prior to beginning installation of imprinted asphalt.

G. Verify that sufficient depth at curbs, walks, lips and other vertical edges is available to place the required thickness of compacted asphalt.

3.02 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.
   1. Pump hot undersealing asphalt under rocking slab until slab is stabilized or, if necessary, crack slab into pieces and roll to reseat pieces firmly.
   2. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.

C. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal./sq. yd.
   1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
   2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

D. Patching: Fill excavated pavements with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

3.03 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
   1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.

B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch.
   1. Clean cracks and joints in existing hot-mix asphalt pavement.
   2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.
   3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.

3.04 BASE COURSE

A. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
   1. Completely proof-roll subgrade in one direction. Limit vehicle speed to 3 mph.
   2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons or other vehicle with similar axel weight.
   3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Landscape Architect, and replace with compacted backfill or fill as directed.

B. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

C. Herbicide Treatment: Not used.

3.05 PREPARATION - PRIMER

A. Do not use if paving takes place not more than 48 hours after final compaction and grading of road bases. If paving must be delayed significantly, re-grade and re-compact road base or apply Prime Coat. Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure.
   1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup

under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.

2. Protect primed substrate from damage until ready to receive paving.

B. Use clean sand to blot excess primer.

3.06 PREPARATION - TACK COAT

A. Apply tack coat on asphalt or concrete surfaces over subgrade surface at uniform rate of 0.05 to 0.15 gal/sq yd (0.19 to 0.57 L/sq m).

B. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.

C. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings.

D. Remove and replace items damaged by overspray or clean affected surfaces as directed by architect at no additional cost to owner.

3.07 PLACING ASPHALT PAVEMENT

A. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

B. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot-mix asphalt surface course in single lift if design thickness is less than 3-inches. If design thickness is more than 3-inches, place in multiple lifts with a minimum thickness of 1.5-inches and a maximum thickness of 3-inches.
2. Spread mix at minimum temperature of 250 deg F.
3. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
4. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

C. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.

D. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

E. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.08 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
3. Offset transverse joints, in successive courses, a minimum of 24 inches.
4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations.".

5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.09 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
   1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
   1. Average Density: 96 percent of reference laboratory density according to ASTM D6927 or AASHTO T 245, but not less than 94 percent nor greater than 100 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Place asphalt so that final compacted asphalt is even with lip of gutter on curbs that drain away from the curb and gutter (open face or depressed curb and gutter). Place asphalt so that final compacted asphalt is 1/4-inch above lip of gutter on curbs that carry water (slope of parking lot is towards the curb). In transition areas, use extra care to make sure that no ponds, bird baths, or depressions are left after paving.

G. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

H. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

I. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.10 SURFACE TREATMENTS

A. Fog Seals: Apply fog seal at a rate of 0.10 to 0.15 gal./sq. yd. to existing asphalt pavement and allow to cure. With fine sand, lightly dust areas receiving excess fog seal.

B. Slurry Seals: Apply slurry coat in a uniform thickness according to ASTM D3910 and allow curing.
   1. Roll slurry seal to remove ridges and provide a uniform, smooth surface.

3.11 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
   1. Surface Course: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
   1. Surface Course: 1/8 inch.
   2. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

C. After paving is complete, pour water on paved areas and identify ponds, bird baths, and depressions. Identify the same at open face and transition sections of curb and gutter. Remove and replace asphalt, curb and gutter, road base, and or sub-base as necessary to fix ponds, bird baths, or depressions at no additional cost to owner.

3.12 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect and approved by the local jurisdictional fire marshal.

B. Allow paving to age for 7 days minimum days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.
   1. Broadcast glass beads uniformly into wet pavement markings at a rate of 6 lb/gal.

E. Color
   1. Yellow: Parking stalls and pedestrian crossings.
   2. Blue: Handicap insignia at appropriate stalls.
   3. Red: Fire lanes and no parking areas.
   4. White: Directional arrows.

3.13 WHEEL STOPS

A. Securely attach wheel stops to pavement with not less than two galvanized-steel dowels embedded at one-quarter to one-third points. Securely install dowels into pavement and bond to wheel stop. Recess head of dowel beneath top of wheel stop.

3.14 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for quality control.

B. A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
   1. Provide field inspection and testing. Take samples and perform tests in accordance with AI MS-2.

C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D3549/D3549M.

D. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

E. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D979 or AASHTO T 168.
   1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D2041/D2041M, and compacted according to job-mix specifications.

2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D1188 or ASTM D2726/2726M. Cores will also be measured for compacted thickness. The owner and architect may also direct additional cores to be taken at locations of their choosing to verify final pavement thickness.
    a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.
    b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D2950/D2950M and correlated with ASTM D1188 or ASTM D2726/2726M.
    c. Coordinate the time and locations of all holes so that cores may be filled.

F. The contractor will replace and compact hot-mix asphalt where core tests were taken.

G. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.15 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.
    1. Do not allow milled materials to accumulate on-site.

END OF SECTION

SECTION 32 8423

UNDERGROUND SPRINKLERS

PART 1 GENERAL

1.01 SUMMARY

A. The work covered by these specifications consists of furnishing all labor, material, equipment and supplies in performing all operations in connection with providing an irrigation system and all site work in strict accordance with provided specifications, details, and drawings.

B. Any minor items of labor and/or materials not specifically noted on the drawings or specifications; but obviously necessary for the proper completion of the work, are to be considered as incidental to and are to be included in the contract. Contractor shall note such items and present them to owner before bid opening.

C. Contractor should submit construction schedule of anticipated work time to facilitate timely visits for review of work. Such proposal shall include a projected time frame for installing the system. It should reflect, in calendar days, the anticipated time required from the day of the award to completion of the system in a fully operational mode. This schedule should reflect anticipated time for ordering and receiving all components, starting and ending times for installation, system start-up, etc. It is the desire of the owner to have a fully operational system by completion date shown on overall project schedule. Owner reserves the right to deduct two Hundred dollars ($200) per day for work completed after the time limit expires.

1.02 SECTION INCLUDES

A. Pipe and fittings, valves, sprinkler heads, and accessories.

B. Provide automatic irrigation system design and installation for all landscaped area providing adequate watering to all trees, shrubs, perennials, groundcovers, and turf.

1.03 DEFINITION

A. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.

B. Drain Piping: Downstream from circuit-piping drain valves. Piping is not under pressure.

C. Mainline Piping: Downstream from point of connection to water distribution piping to and including control valves. Piping is under water distribution system pressure.

1.04 PROJECT CONDITIONS

A. Irrigation water shall be provided by the following:
   1. Water system to be connected to existing 2” mainline.
   2. Design pressure of the irrigation design is 80 psi.

1.05 SYSTEM PERFORMANCE REQUIREMENTS

A. Minimum water coverage:
   1. Irrigation heads in lawn areas shall be spaced 90% of the radius for rotors and 90% of the radius for spray heads.
   2. Shrubs, perennials, and groundcovers shall have adequate water applied to the root zones to ensure plant health and development.

B. The irrigation system shall provide the manufacturer's recommended minimum operation pressure to every head. The pipe system shall have sufficient pressure to overcome the losses due to friction in piping, fittings, and all other equipment. Water

speed in the pipes shall not exceed 5 feet per second in the irrigation mainline and lateral piping.

C. The irrigation system shall provide the manufacturer's recommended minimum operation pressure to every irrigation head.

D. Group irrigation heads into circuits having similar hydrozone requirements as shown on drawings.

E. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties, unless otherwise indicated:
   1. Pressure Piping: 200 psig.
   2. Circuit Piping: 150 psig.
   3. Drain Piping: 100 psig.

1.06 REFERENCE STANDARDS

A. ASTM D2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series); 2015.

B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.

1.07 SUBMITTALS

A. Product Data: Submit technical product data and installation instructions for irrigation system materials and products.

B. Shop Drawings: Submit shop drawings or “as built” drawings for irrigation systems showing piping materials, sizes, locations, and elevations. Include details of underground structures, connections, thrust blocks, and anchoring. Show interface and spatial relationship between piping and proximate structures.

C. Operation and Maintenance Data: include in maintenance manuals specified in Division 1. Include data for the following:
   1. Provide typewritten instructions for operation and maintenance of system and controls, seasonal activation and shutdown, and manufacturer's parts catalog.
   2. Provide schedule indicating length of time each valve is required to be open to provide a determined amount of water.
   3. Submit manuals with record drawings. The manual shall also contain:
      a. Identification readable from the outside of the cover stating by whom the information was compiled.
      b. Neatly type-written index near the front of the manual, furnishing immediate information as to the location in the manual of all emergency data regarding the installation.
      c. Complete nomenclature of all replaceable parts, their part numbers, current cost, and name and address of the nearest vendor of replacement parts.
      d. Complete outline of future watering schedules and when they should be changed from the initial installation schedule. The initial schedule is calculated for a watering rate to establish lawn.
      e. Copy of all guarantees and warranties issued on the installation showing all dates of expiration.

D. Record Drawings: As installation occurs, prepare accurate record drawings of piping system to be submitted prior to final inspection that also includes:
   1. Detail and dimension changes made during construction
   2. Significant details and dimensions not shown in the approved contract documents.
   3. Field dimensioned locations of valve boxes, manual drains, control wire runs not in mainline ditch, and both ends of sleeves.

4. Take dimensions from permanent constructed surfaces or edges located at or above finish grade.
5. Take and record dimensions at time of installation.
6. Fly drone and provide digital imagery/video of pipe, valves, etc.

E. Provide digital high resolution copy of record drawings.

F. Maintenance Materials: Provide the following for Owner's use in maintenance of project.
1. Extra Sprinkler Heads: One of each type and size.
2. Extra Valve Box Keys: One.
3. Wrenches: One for each type head core and for removing and installing each type head.

G. Warranty Documents: Warranty documents shall be submitted to owner at the time of final inspection.

1.08 QUALITY ASSURANCE

A. Manufacturer Qualifications: Licensed firms regularly engaged in manufacture of irrigation system products of types, materials and sizes specified, whose products have been in use in similar service.

B. Work and materials shall be in accordance with latest rules and regulations, and other applicable state or local laws. Nothing in approved Contract Documents is to be construed to permit work not conforming to these codes.

C. Pre-Installation Meeting: Schedule meeting after excavation of trenches and installation of sleeves, but prior to installation of pipe.

D. Installer Qualifications: Licensed contracting firm regularly engaged in successful government municipalities installation of irrigation systems similar in size and scope of this contract. Installer shall have installed a minimum of five park project over the last five years. Installer shall also provide a minimum of five training certificates from WeatherTRAK cources. Owner reserves the right to ask for and verify references from contractors past portfolio of work before award of contract.

1.09 CODES AND STANDARDS

A. Plumbing code compliance: Comply with any applicable portions of the Utah state plumbing code pertaining to the selection of materials and the installation of irrigation systems.

B. Water purveyor compliance: Comply with requirements of purveyor supplying water to the project.

C. Any permits that are needed for the installation of construction of any work included under this contract, which are required by the authorities of jurisdiction, shall be obtained and paid for by the contractor following whatever ordinances, regulations and codes requiring the permits. If the authorities of the jurisdiction require inspection at said points of the installation, the contractor shall arrange for, and be present at, any such inspections.

D. Additional work or furnishing of materials required due to inspection by the authorities of jurisdiction shall be furnished at no cost to the owner. In the event that the specifications for this project and existing ordinances, regulations or codes are in conflict, the conflict shall be noted in writing by the contractor to the owner’s authorized representative, and any necessary changes in work shall follow an established procedure for claims for extra compensation.

1.10 CONTRACTORS USE OF PREMISES

A. Contractor is responsible for damages and interruption of all existing utilities.

B. Contractor shall not unreasonably encumber site with materials and equipment.

C. Contractor shall assume full responsibility for protection and security of materials and equipment stored on job site.

D. Contractor shall confine operations to areas within his contract limits.

E. Any damages to existing structures, surfaces, or utilities caused by contractor or contractor's employees shall be considered contractor's responsibility and will be part of this contract to be corrected to satisfaction of owner.

F. Contractor is responsible for contacting utility locating services and keeping utilities clearly marked on the job site. City owned utilities and piping will be marked by City personnel; however, contractor is responsible to contact the city maintenance department to schedule locating and must give adequate time for locating to be done. Any utilities, wiring, or piping damaged by contractor without following these guidelines will be the sole responsibility of the contractor to repair.

G. Contractor is responsible for safety on job site. Barricading or covering open trenches, eliminating trip hazards, and other safety issues are a priority. Rental or supplying of barricades is contractor's responsibility.

1.11 PERFORMANCE BOND/BID BOND/INSURANCE

A. The owner shall have the right to require the contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements. A bid bond, certified check, or cashiers check executed in favor of Hyrum City in the amount of five percent (5%) of the total bid price must be submitted with the proposal as guarantee that bidder is willing to enter into a contract. Bidder must also be able to provide a one hundred percent (100%) Performance and Payment Bond at time of award of contract.

B. Successful contractor must meet all Federal, State, County and City codes and regulations. Proof of Liability Insurance and Workman's compensation must be submitted with bid.

1.12 SUPERVISION

A. The contractor shall provide a competent superintendent and any necessary assistants on the project when work is in progress. The superintendent shall not be changed during the project without the consent of the owner's representative unless the superintendent ceases his status as an employee of the contractor. The superintendent shall represent the contractor in the contractor's absence, and all directions given to him by the owner's representative shall be binding as if they were given to the contractor.

B. The contractor's superintendent shall supervise the contractor's employees on the job site and be responsible for their actions and conduct on the job site.

1.13 GUARANTEE

A. Submit one-year written guarantee signed by underground sprinkler contractor, agreeing to repair or replace all defects in material, equipment, and workmanship.

B. Guarantee shall also cover repair of damage to any part of the premises resulting from leaks or other defects in material, equipment, and workmanship to the satisfaction of the Owner. Repairs if required, shall be done promptly at no cost to the Owner.

1.14 SEQUENCING AND SCHEDULING

A. Maintain uninterrupted water service to building during normal working hours. Arrange for temporary water shutoff with Owner.

B. Coordinate lawn irrigation piping with work specified in Division 32 9223 "Sodding" and 32 9300 "Plants".

C. Coordinate lawn irrigation piping with utility work.

PART 2 PRODUCTS

2.01 IRRIGATION SYSTEM

A. Manufacturers:
   1. Rain Bird Sales, Inc; Tiffany Haveron (thaveron@rainbird.com): www.rainbird.com/#sle.
   2. Hyrdopoint; Sprinkler Supply
   3. Maximum H2O; Edward Mathieu (edward@overlanddistributing.com): www.maximumh2o.com
   4. Per plan

2.02 FILL MATERIAL

A. Backfill Material
   1. Backfill material for irrigation pipe shall consist of sand, native material or topsoil with no rocks larger than 1/4 inch in any dimension for pipe bedding haunches and initial backfill above the pipe. Above the initial backfill, the trench shall be filled with soil with no debris or rocks greater than 1-1/2 inch in any direction. Landscape architect shall approve on-stie material for backfill operation.
   2. Backfill for irrigation sleeves under pavement shall consist of granular material with no rock size larger than 1/4 inch in any dimension up to the base for the paving above the pipe.
   3. Imported backfill material shall be clean soil, free from organic material, trash, debris, rubbish, broken cement, asphalt material, or other objectionable substances and approved by the Landscape Architect.

B. Drainage Fill Material
   1. Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100% passing a 1-1/2 inch sieve and not more than 5% passing a No. 4 sieve.

2.03 PIPE MATERIALS

A. PVC Pipe: ASTM D2241; 200 psi (1.38 MPa) pressure rated upstream from controls, 160 psi (1.10 MPa) downstream; solvent welded sockets.
   1. All lateral piping 3” and smaller, shall be schedule 40 pressure rated PVC glue joint pipe with ratings printed on outside of pipe.
   2. All main line pipe 3” and larger shall be class 200 pressure rated PVC gasket joint pipe with ratings printed on outside of pipe, unless otherwise noted on drawings or details.
   3. All lateral pipe and fittings shall be schedule 40 pressure rated PVC unless specifically noted on drawings.
   4. All main pressure side valve manifold piping shall be domestic galvanized Iron pipe and fittings. All galvanized iron pipe and fitting configurations shall match detail drawings exactly.

B. Polyethylene Pipe:

1. Pipe shall be continuously and permanently marked with Manufacturer's name, size, schedule, type, and working pressure.
2. All irrigation lateral piping shall be polyethylene plastic pipe ID controlled PE 3408, ASTM 2239.

C. Fittings:
1. Mainlines shall have PVC sch. 40 fittings for pipe sizes 1 inch through 1-1/2 inch, PVC sch. 80 for pipe sizes 2 inch and push on ductile or mechanical cast iron fittings on PVC mainline 2-1/2 inch and larger.
2. Main line pressure fittings shall be cast iron manufactured by Harco or approved equal.
3. All polyethylene pipe fittings shall be compression fittings or insert barbed fittings secured with stainless steel clamps.
4. Remote control valve connection to mainline shall be PVC SST tee, epoxy coated double strap saddle, M.J. tee, or Harco Ductile Irons Service tees.
5. Joint restraint shall be Leemco or approved equal.

D. Sleeve Material: Sch. 40 PVC.
1. Sleeve diameter shall be two times larger than pipe that is to be installed in sleeve. Sleeves 4" and smaller diameter shall be PVC schedule 40. Sleeves 4 inch and larger shall be Class 200 PVC or PVC sewer pipe.
2. Piping and control wires under walks, roads, or other hard surfaces shall be installed in class 200 PVC sleeves of adequate size or as noted on drawings.
3. Sleeves for electrical conduit shall be adequate to accommodate minimum conduit sizes as required by uniform electrical code.
4. Wire sleeves shall be PVC pipe or electrical tubing. Mazimum number of 14-gauge wire in sleeve shall be as follows:
   a. 1-10 wires in a 1 inch sleeve
   b. 11-18 wires in a 1-1/4 inch sleeve
   c. 19-25 wires in a 1-1/2" sleeve
   d. 26-40 wires in a 2" sleeve
   e. 41-56 wires in a 2-1/2" sleeve
   f. 57-88 wires in a 3" sleeve

E. Pipe Connection Material
1. P-70 primer
2. 711 solvent/glue
3. Teflon tape

2.04 OUTLETS

A. Manufacturers:
1. Per Plan.

B. Outlets: Brass construction.

C. All sprinkler heads shall be the brand, model, size, and type shown on drawings.

D. All sprinkler heads shall be installed on a “swing joint” assembly. Lawn spray heads and small rotors with an inlet size 3/4'” and smaller shall be installed as per manufacturer’s recommendations with “funny pipe” and “swing ells” as manufactured by Rain Bird or approved equal. All large stream rotor and impact heads shall be installed with three 1” schedule 40 marlex street ells and one schedule 80 1”X12” nipple. Prefabricated swing joint assemblies by Spears Manufacturing or other approved equal can be substituted if desired. All “swing joint” configurations shall match detail drawings exactly.

E. Per plan and manufacturers recommendations.

2.05 VALVES

A. Manufacturers:
   1. Per Plan

B. All control/master valve/quick coupler valves

C. Valve Box and Cover: all boxes to have locking lids.
   1. Control valve boxes shall be appropriate size, made of HDPE plastic, green in color, with bolt down lid. Valve boxes shall be made by Carson Industries or approved equal. No more than one valve shall be located in each plastic box.
   2. Circuit or Isolation valve: Carson 1220 jumbo box or approved equal.
   3. Valve box supports: standard size fired clay paving bricks without holes.

2.06 CONTROLS

A. Manufacturers:
   1. Hydropoint.

B. Controller: WeatherTrak commercial controller.
   1. Cellular connection to controller with 10 year subscription.
   2. Provide any wiring, communication, links computer programs to make weather station and controller operational.

C. Controller Housing: Stainless Steel Pedestal Enclosure.

D. Wire Conductors:
   1. Electrical Wire:
      a. All wiring shall conform to the National Electrical Code.
   2. Traditional Wiring:
      a. Control wire shall be UL listed direct burial cable not smaller than 14 gauge. In some cases 18-gauge multi-strand wire is used in special situations as shown on drawings and approved by owner.
      b. Colors of wire shall be as follows:

1) Control wire for turf areas:	Red
2) Control wire for shrub areas:	Yellow
3) Control wire to master valve:	Blue
4) Control wire to filter blowout valve:	Brown
5) Common wire:	White
6) Extra wires	Orange

   3. Two Wire Cable:
      a. Control cable from controller to valve decoders shall be 14-guage Rainbird Maxi-Cable.
      b. Install all two-wire cable in electrical conduit. Place a coupling fitting on the ends of the pipe to protect wire jacket from sharp edges of the pipe when it is pulled through.
      c. Control wire from decoder to irrigation valve shall be UF-UL listed, copper conductor direct burial size 14. Color code each valve's wire differently from other valve wires in a decoder group. Do not use green color-coded wire.
      d. All wire splices shall be made with 3M DBY-6 waterproof connectors.
      e. Surge protectors shall be Rain Bird LSP-1, FD-401 TURF or FD-601 TURF with built in surge protection.
      f. All two wire lines shall have Decoder Cable Fuse Devices at indicated intervals for line maintenance and grounding the two-wire line.
      g. Grounding
         1) Shall be done according to manufactures specifications.

2) Ground rods shall be used with CAD Weld. Preferred over traditional grounding clamp.

4. Expansion Curls: shall be provided within three (3) feet of each wire connection to solenoid and at least every three hundred (300) feet in length. (Expansion curls are formed by wrapping 36” of wire around a rod or pipe 1" or more in diameter, then withdrawing the rod for single strand wire and loosely coiled for two wire cable).

2.07 PUMP & FILTER

A. Per plan.

2.08 OTHER COMPONENTS

A. Per Plan.

B. Flow Sensor: See irrigation schedule for flow sensor.

C. Mixes: Concrete for thrust blocks on irrigation pipe 3" or larger.
   1. One cu. ft. cement, 2 cu. ft. sand, 4 cu. ft. gravel, and 5 gallons minimum to 6 gallons maximum water.
   2. Mix thoroughly before placing.

D. Submit other components recommended by Manufacturer for Architect’s review and acceptance prior to installation.

E. Provide components necessary to complete and make system operational.

F. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Deliver extra materials to Owner.
   1. Two valve box cover keys.
   2. Two quick coupler keys with brass hose swivel.
   3. Two manual drain valve keys.
   4. Two sets of sprinkler wrenches for adjusting, cleaning or disassembly of each type of sprinkler.
   5. Two each of any other tools required for any other equipment.

PART 3 EXECUTION

3.01 OWNERS SALVAGE RIGHTS

A. Any items removed and not reused in contract will remain owner’s property and will be returned to owner at his discretion.

3.02 EXAMINATION

A. Verify location of existing utilities.

B. Verify that required utilities are available, in proper location, and ready for use.

C. Prior to installation of irrigation system, the contractor must verify the supply pressure at the work site. If there is a failure to obtain the needed pressure or if an excess pressure situation exists for normal operation, the contractor must contact the owner for any adjustments to the supply or irrigation system design. Failure to report any discrepancies in pressure due to any reason, and any installation done prior to notification of owner shall be done at the expense of the contractor.

3.03 PREPARATION

A. During construction and storage, protect materials from damage and prolonged exposure to sunlight.

B. Work damaged during course of work in this section shall be replaced or repaired at no additional cost to Owner. If damaged work is new, repair or replacement shall be performed by installer of original work.

C. Layout and stake locations of system components.

D. Review layout requirements with other affected work. Coordinate locations of sleeves under paving to accommodate system.

E. All lateral lines shall run parallel with planting areas and avoid conflict with the location of plant materials. Where trenching is required in proximity to plant materials care shall be taken to avoid damage to roots. Do not cut existing tree roots measuring over 2 inches in diameter.

3.04 TRENCHING

A. Trench Size:
   1. Minimum Cover Over Installed Supply Piping (Mainline): 18 inches (457 mm).
   2. Minimum Cover Over Installed Branch Piping (Lateral): 12 inches (305 mm).

B. Trench to accommodate grade changes.

C. Maintain trenches free of debris, material, or obstructions that may damage pipe.

D. Pulling of pipe is not permitted.

E. When digging on project site, the area shall be "blue staked" to identify the approximate location of all known underground utilities and structures.

F. Excavation work shall be as deep and as wide as required to safely perform the work, such as making mainline connections or forming vaults. Where trenching is done in established lawn, care must be taken to keep the trenches only as wide as is necessary to accomplish the work.

G. If more than one line is required in a single trench, that trench shall be deep and wide enough to allow for at least 3 inches of separation between pipes. Install the piping in a manner for easy repair in the future.

H. Over-excavate trenches 2 inches and bring back to indicated depth by filling with backfill material as specified under Part 2 - Products. Separate out rocks larger than 1-1/2 inch in any direction uncovered in trenching operation from excavated material and remove from areas to receive landscaping.

I. Where is becomes necessary to excavate beyond the limits of normal excavation lines to remove rock or other interfering objects, the void remaining after the removal of the object shall be backfilled with suitable material and compacted as per the "Earthwork" section. The removal of all rock or other interfering objects and the backfilling of voids left by such removals shall be at the expense of the contractor.

J. Any existing utility lines damaged during excavating or trenching shall be repaired immediately after notification of the utility owner and to his/her satisfaction. Should utility lines be encountered, which are not indicated on plans, the project representative shall be notified. The repair of any damage shall be done as soon as possible by the contractor or the utility owner and proper compensation will be negotiated by the owner. Such utility locations shall be noted on the "as-built" drawings.

3.05 INSTALLATION

A. General:
   1. Install pipe, valves, controls, and outlets in accordance with manufacturer's instructions.
   2. Connect to utilities.

3. Set outlets and box covers at finish grade elevations.
4. Provide for thermal movement of components in system.

B. Pipes:
1. Install pipe in manner to provide for expansion and contractions as recommended by manufacturer.
2. Unless otherwise indicated on approved drawings, install main lines and lateral lines connecting rotor pop-up sprinklers with minimum cover of 18 inches based on finished grade. Install remaining lateral lines with minimum of 12 inches of cover based on finish grade.
3. Install pipe and wires under driveways or parking areas in specified sleeves 18 inches minimum below finish grade or as shown on approved drawings.
4. Slope pipes under parking areas or driveways to drain outside these areas.
5. Locate sprinkler heads no closer than 12 inches from building foundation. Heads immediately adjacent to mow strips, walks, or curbs shall be one inch below top of mow strip, walk, or curb and have 1 to 3 inches clearance between head and mow strip, walk, or curb.
6. Slope piping for self drainage to control box where possible.
7. Where this is not possible, slope pipe to a minimum number of low points. Install at these low points:
    a. 3/4 inch manual drain
    b. Install 2 inch class 200 PVC pipe over top of manual drain and cut at finish grade,
    c. Install rubber valve cap marker flush with finished grade.
    d. Do not use automatic drain valves.
8. Cut plastic pipe square. Remove burrs at cut ends prior to installation so unobstructed flow will result.
9. Make solvent weld joints as follows:
    a. Do not make solvent weld joints if ambient temperature is below 40 degrees F.
    b. Clean mating pipe and fitting with clean, dry cloth and apply one coat of P-70 primer to each.
    c. Apply uniform coat of 711 solvent to outside of pipe.
    d. Apply solvent to fitting in a similar manner.
    e. Re-apply light coat of solvent to pipe and quickly insert into fitting.
    f. Give pipe or fitting a quarter turn to ensure even distribution of solvent and make sure pipe is inserted to full depth of fitting socket.
    g. Hold in position for 15 seconds minimum or long enough to secure joint.
    h. Wipe off solvent appearing at outer shoulder of fitting.
    i. Do not use excessive amount of solvent thereby causing obstruction to form on inside of pipe.
    j. Allow joints to set at least 24 hours before applying pressure to PVC pipe.
10. Threaded connections shall be made with teflon tape.

C. Sleeving:
1. Contractor is responsible to coordinate the installation of sleeving with the work of other trades (i.e. concrete, asphalt paving, etc.)
2. Sleeve irrigation water lines and control wires under walks and paving. Extend sleeves 6 inches minimum beyond walk or pavement edge. Cap sleeves until pipes and wires are installed to keep sleeve clean and free of dirt and debris.
3. Use one water pipe maximum per sleeve. Sleeve control wiring in separate sleeve.

4. Position sleeves with respect to buildings and other obstructions so pipe can be easily removed.

D. Outlets:
   1. Use threaded nipples for risers to each outlet.
   2. Sprinkler Heads:
      a. Prior to installation of sprinkler heads, open control valves and use full head of water to flush out system.
      b. Set sprinkler heads and quick-coupling valves perpendicular to finish grade.
      c. Do not install sprinklers using side inlets. Install using base inlets only.
      d. Set sprinklers at a consistent distance from existing walks, curbs, and other paved areas and to grade.
      e. Shrub spray heads shall be installed on risers a minimum of 12 inches above finish grade of planting area where not adjacent to pedestrian areas. At shrub areas adjacent to pedestrian access use 12" pop-up spray heads.

E. Controls:
   1. Install irrigation controller per manufacturer's recommendation and with proper grounding for surge and lightning protection.
   2. Install irrigation controller per drawings.

F. Valves & Valve Boxes:
   1. Install control wires, and valves in accordance with Manufacturer's recommendations and per electrical code.
   2. Install valves, in plastic boxes with locking reinforced heavy-duty plastic covers. Locate valve box tops at finish grade. Do not install more than two valves in a single box.
   3. Place pea gravel a minimum of 6 inches deep below valve for drainage. Extend washed gravel 3 inch minimum beyond limits of valve box. Maintain 4 inch minimum between bottom of valve and top of gravel and 3 inches minimum clearance between the top of the valve to the bottom of valve cover. Set valve boxes over valve so all parts of valve can be reached for service. Set cover of valve box even with finish grade. Valve box shall be reasonably free from dirt and debris.
   4. Install 3/4 inch brass ball valve in valve box on downstream side of automatic valves if lateral line slopes toward valve box.
   5. Install quick coupling valves in appropriate locations in valve boxes.
   6. Isolation valves, and any other equipment required by local authorities shall be installed according to local codes and requirements in order to make this system complete.
   7. Install isolation valves, Air Release Valve, Master control Valves and Flow Sensors according to details plans and manufactures recommendations.
   8. Install any other equipment required by local authorities according to local codes and requirements in order to make this system complete.

G. Wiring:
   1. Standard Wire:
      a. Tape control wire to side of main line every 10 feet. Where control wire leaves main or lateral line, enclose it in Class 200 PVC conduit.
      b. Place all waterproof wire splice connectors inside valve boxes.
      c. Use white or gray color for common wire and other colors for all other wire. Each common wire may serve only one controller. Provide 12 inches of expansion loop slack wire at all connections inside valve box.

d. Run one extra control wire from panel continuously from valve to valve throughout system like the common wire for use if the common wire fails. Wire shall be a different color than all other wires and shall be marked in control box as an extra wire. Extend extra control wires 24 inches and leave coiled in each valve box.

H. Earth Grounding:
   1. Earth Grounding rod(s) or plate(s) shall provide a minimum resistance of 10 omhs or less. A minimum of one rod is required but second rod a plate or multiple rods and plates may be required if the rods or plates resistance are over 10 omhs.
   2. Ground rods and plats shall be attached to ground wire by Cadweld Connection.
   3. Electrical discharge areas for rods and plates are to be kept moist. Install in lawn area or provide irrigation for to maintain soil moisture as needed.
   4. Install Ground Enhancement Materials if necessary, to improve soil conductivity.
   5. Provide inground surge protection for irrigation controller as per details and environmental conditions.
   6. Rainbird Install in line surge protectors for two wire control systems every 500 feet or every 5 decoders which every is smallest and at the end of each two-wire path over 25'.
   7. Grounding test shall be done. Tester must be approved by Ogden City. Ogden City can provide tester to be paid by the contractor.

I. Flow Sensor: Install flow sensor per manufactures' recommendations. Set flow sensor in a location where there is at least 10 upstream and 5 downstream diameters of pipe having a straight uninterrupted flow.

J. After piping is installed, but before outlets are installed and backfilling commences, open valves and flush system with full head of water.

3.06 FIELD QUALITY CONTROL

A. Visual inspection checklist provided at the end of this section for reference. Coordinate with landscape architect or owner at least 2 working days prior to needed visit.

B. Notify landscape architect two working days minimum prior to testing.

C. Field inspection and testing will be performed under provisions of Section 01 4000 - Quality Requirements.

D. Prior to backfilling, test system for leakage at main piping to maintain 100 psi (690 kPa) pressure for six hours minimum.

E. System is acceptable if no leakage or loss of pressure occurs and system self drains during test period.

3.07 BACKFILLING

A. Cover both top and sides of pipe with 3 inch (75 mm) of backfill material as specified under Part 2 - Products.

B. Backfill trench and compact to within 5 inches (127 mm) of finish grade as specified in related sections. Protect piping from displacement. Top 5 inches (127 mm) of backfill shall be topsoil as specified in related section.

C. Do not cover pressure main, sprinkler pipe, or fittings until pressure test has been completed and architect has inspected and approved the system

D. After backfilling, perform an operating test of the entire system. Operate the entire system through one cycle of the controller for the purpose of checking coverage and

assuring the absence of leaks. Repair water lines, valves, or connections which show evidence of leakage.

E. All trenches shall be backfilled and then saturated with water sufficiently to ensure no settling of the surface after lawn in planted.

F. Any portion of the system which shows defects or leakage shall be repaired to the satisfaction of the landscape architect and Owner or be replaced. After all repairs or replacements have been made and approved by the landscape architect, the above required test shall be made again.

3.08 SYSTEM STARTUP

A. Prepare and start system in accordance with manufacturer's instructions.

B. Adjust control system to achieve time cycles required to provide proper amounts of water to all plants.

C. Adjust heads to proper grade when turf is sufficiently established to allow walking on it without appreciable harm. Such lowering or raising of heads shall be part of original contract with no additional cost to Owner.

D. Adjust sprinkler heads for proper distribution and so spray does not fall on building.

3.09 CLOSEOUT ACTIVITIES

A. At the point of substantial completion of work outlined in these plans, the landscape contractor shall contact the Owner's representative and arrange for a walk through to verify the installation of the system. A coverage test will be completed and the system installation inspected and a punch list of final items needing completion made.

B. At the time of final inspection, the entire system must be tested in the presence of owner’s representative. It must be fully operational in a satisfactory condition, with full uniform coverage of the areas indicated to be irrigated. All heads shall be adjusted to pattern, radius, and grade level.

C. Before the inspection is complete, the contractor must furnish the “as built” drawings. These drawings should be updated on a daily basis to ensure accuracy. These drawings must show the location of all piping, valves, heads, wire splices and other pertinent information. These drawings and all maintenance manuals must be submitted at the time of final inspection in accordance with section 1.3 of these specifications.

D. If at the time of the final inspection there is any additional work to satisfy contract requirements, it will be noted on a “punch list”. Contractor will have 10 days in order to satisfy, or make suitable arrangements with owner to satisfy items on the “punch list”. At owners discretion final payment or a portion thereof, could be held pending completion of “punch list” items.

E. Instruct Owner's personnel in operation and maintenance of the system, including adjusting of sprinkler heads. Use operation and maintenance data as basis for demonstration.

3.10 CLEAN-UP AND MAINTENANCE

A. Remove from site all debris resulting from work of this section.

B. Provide one complete spring start-up and a fall shutdown by installer, at no extra cost to Owner.

3.11 WARRANTY

A. All work shall be warranted for compliance with the contract requirements, including replacement, for a period of one year from date of substantial completion. If an

unsatisfactory condition develops during the warranty period and is due to negligence, faulty materials, or workmanship, contractor shall immediately place such items in a satisfactory condition. All warrantees shall be in writing, signed by contractor or legal representative, and worded as approved by owner. Warranty documents shall be presented to owner at the time of final inspection.

B. During one-year Warranty period, contractor will comply with the following:
   1. Fill and repair low areas and replace plantings due to settlement of excavated areas.
   2. At the end of the first watering season, contractor shall shut off and winterize the system.
   3. At the beginning of the next season, contractor shall restart system and make any repairs or adjustments needed to make system fully operational.

END OF SECTION

PRIME
LANDSCAPE ARCHITECTURE

VISUAL INSPECTION

Date:
Project:

_____ 1 Irrigation

- _____ Sleeves
- _____ Thrust blocks
- _____ Main Line / Wire
- _____ Lateral Lines
- _____ Trench Backfilling (material & depths)
- _____ Head/Elbow Connection
- _____ Valve Manifolds
- _____ Valve Boxes
- _____ Wire Connections
- _____ Drip Emitters at Plant

_____ 2 Landscape

- _____ Tree Pits
- _____ Tree Staking
- _____ Tree Trunk
- _____ Burlap & Wire Removal
- _____ Shrub Pits
- _____ Sod Joints
- _____ Topsoil Placement & Depth
- _____ Mulch Thickness
- _____ Weed Barrier

SECTION 32 9113

SOIL PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Perform soil preparation work.

B. Furnish and apply soil amendments.

C. Perform fine grading work required to prepare site for paving finish grading and for landscape finish grading.

1.02 REFERENCES

A. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.

1.03 SUBMITTALS

A. Product Data: Product literature and chemical /nutrient analysis of soil amendments and fertilizers.

B. Informational Submittals:
   1. Field Quality Control Submittals:
      a. Submit tests on imported and site topsoil by licensed laboratory before use.
         1) Before use, topsoil shall meet minimum specified requirements and be approved by Architect.
         2) If necessary, submit proposed amendments and application rates necessary to bring topsoil up to minimum specified requirements.
      b. Submit report stating location of source of imported topsoil and account of recent use.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil:
   1. Topsoil used in landscaped areas, whether imported, stockpiled, or in place, shall be fertile, loose, friable soil meeting the following criteria:
      a. Chemical Characteristics:
         1) Acidity / alkalinity range: pH 5.5 to 8.0.
         2) Soluble Salts: less than 3.0 mmhos/cm.
         3) Sodium Absorption Ratio (SAR): less than 6.0.
         4) Organic Matter: greater than one percent.
      b. Physical Characteristics:
         1) Gradation as defined by USDA triangle of physical characteristics as measured by hydrometer.
            (a) Sand: 15 to 60 percent
            (b) Silt: 10 to 60 percent
            (c) Clay: 5 to 30 percent
         2) Clean and free from toxic minerals and chemicals, noxious weeds, rocks larger than 1-1/2 inch in any dimension, and other objectionable materials.
         3) Soil shall not contain more than 2 percent by volume of rocks measuring over 3/32 inch in largest size.
      c. Fertility Requirements:
         1) Nitrate-nitrogen ppm > 20
         2) Phosphorous ppm > 15

3) Potassium ppm > 150
4) Iron ppm > 10

B. Soil Amendments:
1. Incorporate following soil amendments into topsoil, either import or stockpiled, used on site. Adjust application rates and add amendments that shall bring the soil to comply with soils test:
a. Acceptable Soil Amendments And Application Rates:
1) Sulfur - 0.5 lbs. per 1000 sq. ft.
2) Equal as approved by Architect before installation.
b. Acceptable Fertilizers And Application Rates:
1) Lawns: Phosphorus 1-2 lbs per 1000 sq. ft., Potassium 2 lbs. per 1000 sq.ft., and Nitrogen 2-4 lbs. per 1000 sq. ft.
2) Shrubs: Phosphorus 1-2 lbs per 1000 sq. ft., Potassium 2 lbs. per 1000 sq.ft., and Nitrogen 1-2 lbs. per 1000 sq. ft.
3) Equal as approved by Architect before installation.
c. Acceptable Soil Conditioners And Application Rates:
1) Type One Acceptable Products.
(a) Soil conditioner that meets the required fertilizer and soil amendments stated above can be used at the discretion of the contractor.

PART 3 EXECUTION

3.01 PERFORMANCE

A. Protection of In-Place Conditions: Protect utilities and site elements from damage.

B. Soil Amendments:
1. Add specified soil amendments at specified rates to lawn areas.
2. Roto-till or otherwise mix amendments evenly into top 4 inches of topsoil.
3. Incorporate and leach soil amendments which require leaching, such as gypsum, within such time limits that soil is sufficiently dry to allow proper application of fertilizer and soil conditioners.

C. Surface Preparation:
1. Landscaping and Planting Areas:
a. Before grading, dig out weeds from planting areas by their roots and remove from site. Remove rocks larger than 1-1/2 inches in size and foreign matter such as building rubble, wire, cans, sticks, concrete, etc.
b. Before beginning maintenance period, plants shall be in at least as sound, healthy, vigorous, and in approved condition as when delivered to site, unless accepted by Architect in writing at final landscape inspection.
c. Remove imported paving base material present in planting areas down to natural subgrade or other material acceptable to Architect.

D. Performance:
1. Do not expose or damage existing shrub or tree roots.
2. Tolerances:
a. Landscaping and Planting Tolerances:
1) Maximum variation from required grades shall be 1/10 of one foot.
2) To allow for final finish grades of planting areas, fine grade elevations before placing topsoil and mulch are:
(a) Sod Areas: 5.5 inches below top of walk or curb.

3. Do not expose or damage existing shrub or tree roots. Redistribute approved existing topsoil stored on site. Remove organic material, rocks and clods greater than 1-1/2 inch in any dimension, and other objectionable materials.
4. Slope grade away from building as specified. Direct surface drainage in manner indicated on Drawings by molding surface to facilitate natural run-off. Fill low spots and pockets with specified fill material and grade to drain properly.

END OF SECTION

SECTION 33 4100

SODDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Placing topsoil.

B. Fertilizing.

C. Sod installation.

D. Maintenance.

1.02 RELATED REQUIREMENTS

A. Section 31 2200 - Grading: Preparation of subsoil and placement of topsoil in preparation for the work of this section.

1.03 DEFINITIONS

A. Weeds: Includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.04 REFERENCE STANDARDS

A. 21 CFR 11 - Part 11, Electronic Records; Electronic Signatures — Scope and Application; Current Edition.

B. TPI (SPEC) - Guideline Specifications to Turfgrass Sodding; 2006.

1.05 QUALITY ASSURANCE

A. Sod Producer: Company specializing in sod production and harvesting with minimum five years experience, and certified by the State of Utah.

B. Installer Qualifications: Engage an experienced installer who has completed landscaping work similar in material, design, and extent to that indicated for this project and with a record of successful landscape establishment.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver sod in rolls. Protect exposed roots from dehydration.

B. Do not deliver more sod than can be laid within 24 hours.

C. Harvest, deliver, store, and handle sod according to the requirements of the American Sod Producer's Association (ASPA) "Specifications for Turfgrass Sod Materials and Transplanting/Installing".

1.07 PROJECT CONDITIONS

A. Utilities: Determine location of above grade and underground utilities and perform work in a manners which will avoid damage. Hand excavate as required. Maintain grade stakes until removal is mutually agreed upon by parties concerned.

B. Excavation: When conditions detrimental to plant growth are encountered such as rubble fill, adverse drainage conditions, or obstructions, notify landscape architect before planting.

1.08 COORDINATION AND SCHEDULING

A. Coordinate installation of planting materials during normal planting seasons for each type of plant material required.

1.09 WARRANTY

A. General Warranty: the special warranty specified in this article shall not deprive the owner of other rights the owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the contractor under requirements of the Contract Documents.

B. Special Warranty: warrant all lawn areas for a period of one year after date of substantial completion against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by owner, abnormal weather conditions unusual for warranty period, or incidents that are beyond contractor's control.

C. Remove and replace dead materials immediately unless required to plant in the succeeding planting season.

D. A limit of one replacement of each plant material will be required, except for losses or replacements due to failure to comply with requirements.

PART 2 PRODUCTS

2.01 MATERIALS

A. Sod: TPI (SPEC), Certified Turfgrass Sod quality; cultivated grass sod; type indicated in plant schedule on Drawings; with strong fibrous root system, free of stones, burned or bare spots; containing no more than 5 weeds per 1000 sq ft (100 sq m). Minimum age of 18 months, with root development that will support its own weight without tearing, when suspended vertically by holding the upper two corners.
   1. Kentucky Blue Grass Type: 3 cultivar minimum.
   2. Thickness: "Thin" sod, minimum 1/2 inch (13 mm) and maximum 1 inch (25 mm) topsoil base.
   3. Thickness: "Thick" sod, minimum 1 inch (25 mm) and maximum 1-3/8 inch (35 mm) topsoil base.
   4. Cut sod in area not exceeding 1 sq yd (1 sq m).
   5. Machine cut sod and load on pallets in accordance with TPI (SPEC) Guidelines.

B. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay, or impurities, plants, weeds and roots; pH value of minimum 5.4 and maximum 7.0. Bring surface to specified elevation relative to walk or curb.

C. Commercial Fertilizer: Complete fertilizer of neutral character; recommended for grass, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, to the following proportions:
   1. Nitrogen: >16% (of which 50% will be organic). Provide nitrogen in a form that will be available to lawn during initial period of growth.
   2. Phosphoric Acid: 16%
   3. Soluble Potash: 8%

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared soil base is ready to receive the work of this section. Examine areas to receive landscaping for compliance with requirements and for conditions affecting performance of work if this section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Place topsoil in accordance with Section 31 2200.

B. Loosen sub-grade to a minimum depth of 4 inches. Remove stones larger than 1-1/2 inches in any dimension, sticks, roots, rubbish, and other extraneous materials.

C. Spread planting soil mixture to depth required to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Do not spread if planting soil or sub-grade is frozen.
   1. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened sub-grade to create transition layer and then place remainder of planting soil mixture.
   2. Allow for sod thickness in areas to be sodded.

D. Preparation of unchanged grades: where lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare soil as follows:
   1. Till surface soil to a depth of at least 6 inches. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches of soil. Trim high areas and fill in depressions. Till soil to a homogenous mixture of fine texture.
   2. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

E. Grade lawn and grass areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future. Remove trash, debris, stones larger than 1-1/2 inches in any dimension, and other objects that may interfere with planting or maintenance operations.

F. Moisten prepared lawn areas before planting when soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

G. Restore prepared areas if eroded or otherwise disturbed after fine grading and before planting.

H. Topsoil depth shall be a minimum of 4 inches.

3.03 FERTILIZING

A. Apply fertilizer in accordance with manufacturer's instructions.

B. Apply after smooth raking of topsoil and prior to installation of sod.

C. Apply fertilizer no more than 48 hours before laying sod.

D. Mix thoroughly into upper 2 inches (50 mm) of topsoil.

E. Lightly water to aid the dissipation of fertilizer.

3.04 LAYING SOD

A. Moisten prepared surface immediately prior to laying sod.

B. Lay sod within 24 hours after harvesting to prevent deterioration. Do not lay sod if dormant or if ground is frozen.

C. Lay sod smooth and tight with no open joints visible, and no overlapping; stagger end joints 12 inches (300 mm) minimum. Do not stretch or overlap sod pieces.

D. Where new sod adjoins existing grass areas, align top surfaces.

E. Where sod is placed adjacent to hard surfaces, such as curbs, pavements, etc., place top elevation of sod 1/2 inch (13 mm) below top of hard surface.

F. Lay sod across angle of slopes exceeding 1:3.

G. On slopes 6 inches per foot (500 mm per m) and steeper, lay sod perpendicular to slope and secure every row with wooden pegs at maximum 2 feet (600 mm) on center. Drive pegs flush with soil portion of sod.

H. Water sodded areas immediately after installation. Saturate sod to 4 inches (100 mm) of soil. During first week, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below the sod.

I. After sod and soil have dried, roll sodded areas to ensure good bond between sod and soil and to remove minor depressions and irregularities.

3.05 CLEAN-UP AND PROTECTION

A. During landscaping, keep pavement clean and work area in an orderly condition.

B. Protect landscaping from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

3.06 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the owner's property.

3.07 MAINTENANCE

A. Provide maintenance at no extra cost to Owner; Owner will pay for water.

B. Maintain sodded areas immediately after placement until grass is well established and exhibits a vigorous growing condition, but not less than 60 days after date of substantial completion and second full mowing has been performed.

C. Mow grass at regular intervals to maintain at a maximum height of 2-1/2 inches (65 mm). Do not cut more than 1/3 of grass blade at any one mowing. Do not delay mowing until grass blades bend over and become matted. Do not mow grass when wet.

D. Apply fertilizer to lawn after first mowing and when grass is dry. Use fertilizer that will provide actual nitrogen of at least 1 lb. per 1000 sq. ft. of lawn area.

E. Neatly trim edges and hand clip where necessary.

F. Immediately remove clippings after mowing and trimming.

G. Water to prevent grass and soil from drying out to a uniform depth of 4 inches. Water lawn at the minimum rate of 1 inch per week.

H. Roll surface to remove irregularities.

I. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.

J. Immediately replace sod to areas that show deterioration or bare spots.

K. Protect sodded areas with warning signs during maintenance period.

END OF SECTION

SECTION 32 9300

PLANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preparation of subsoil.

B. Topsoil bedding.

C. New trees, plants, and ground cover.

D. Relocated trees, plants, and ground cover.

E. Mulch and Fertilizer.

F. Maintenance.

G. Tree and Shrub Pruning.

1.02 DEFINITIONS

A. Weeds: Any plant life not specified or scheduled.

B. Plants: Living trees, plants, and ground cover specified in this Section, and described in ANSI Z60.1.

1.03 REFERENCE STANDARDS

A. ANSI A300 Part 1 - American National Standard for Tree Care Operations -- Tree, Shrub and Other Woody Plant Maintenance -- Standard Practices; 2017.

B. ANSI/AHIA Z60.1 - American National Standard for Nursery Stock; 2014.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed landscaping work similar in material, design, and extent to that indicated for this project with at least 5 years experience and a record of successful landscape establishment.

B. Provide quality, size, genus, species, and variety of trees, shrubs, and plants indicated complying with the applicable requirements of ANSI/AHIA Z60.1.

C. Measure trees and shrubs according to ANSI/AHIA Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches above ground for trees up to 4 inch caliper size and 12 inches above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.

D. Tree Pruning: Conform to ANSI A300 Part 1.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Trees and Shrubs: Deliver freshly dug trees and shrubs. Do not prune before delivery, except as approved by landscape architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy natural shape. Provide protective covering during delivery. Do not drop trees and shrubs during delivery.

B. Handle balled and burlapped stock by the root ball.

C. Deliver trees, shrubs, ground covers, and plants after preparations for planting have been completed and install immediately. If planting is delayed more than 6 hours after delivery, set planting materials in shade, protect from weather and mechanical damage, and keep roots moist.

1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
2. Do not remove container-grown stock from containers before time of planting.
3. Water root systems of trees and shrubs stored on site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

D. Protect and maintain plant life until planted.

E. Deliver plant life materials immediately prior to placement. Keep plants moist.

1.06 FIELD CONDITIONS

A. Do not install plant life when ambient temperatures may drop below 35 degrees F (2 degrees C) or rise above 90 degrees F (32 degrees C).

B. Do not install plant life when wind velocity exceeds 30 mph (48 k/hr).

C. Utilities: Determine location of above grade and underground utilities and perform work in a manner which will avoid damage. Hand excavate as required. Maintain grade stakes until removal is mutually agreed upon by parties concerned.

D. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify landscape architect before planting.

1.07 COORDINATION AND SCHEDULING

A. Coordinate installation of planting materials during normal planting seasons for each type of plant material required.

1.08 WARRANTY

A. General Warranty: the special warranty specified in this article shall not deprive the owner of other rights the owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the contractor under requirements of the Contract Documents.

B. Special Warranty: warrant trees, shrubs, and plants for a period of one year after date of substantial completion against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by owner, abnormal weather conditions unusual for warranty period, or incidents that are beyond contractor's control.

C. Replacements: Plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.
1. Remove and replace dead planting materials immediately unless required to plant in the succeeding planting season.
2. Replace planting materials that are more than 25% dead or in an unhealthy condition at end of warranty period.
3. A limit of one replacement of each plant material will be required, except for losses or replacements due to failure to comply with requirements.

PART 2 PRODUCTS

2.01 TREE AND SHRUB MATERIAL

A. Plants: Species and size identified in plant schedule, grown in climatic conditions similar to those in locality of the work.

B. General: Furnish nursery-grown trees and shrubs conforming to ANSI/AHIA Z60.1, with healthy root systems, developed by transplanting or root pruning. Provide well shaped, fully-branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

C. Grade: Provide trees and shrubs of sizes and grades conforming to ANSI/AHIA Z60.1 for type of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to landscape architect with proportionate increase in size of roots and ball.

D. Label at least 1 tree and 1 shrub of each variety and caliper with a securely attached, waterproof tag bearing legible designation of botanical and common name.

2.02 SHADE AND FLOWERING TREES

A. Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, conforming to ANSI/AHIA Z60.1 for type of trees required.

B. Small Trees: Small upright or spreading type, branched or pruned naturally according to species and type, and with relationship of caliper, height, and branching recommended by ANSI/AHIA Z60.1.

C. Provide balled and burlapped trees when specified on approved plans.

2.03 SHRUBS AND PERENNIALS

A. Form and Size: Shrubs with not less than the minimum number of canes required by and measured according to ANSI/AHIA Z60.1 for type, shape, and height of shrub.

B. Provide balled and burlapped or container shrubs and perennials.

2.04 SOIL MATERIALS

A. Provide approved imported topsoil required to bring surface to specified elevation relative to walk or curb.

B. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; minimum pH value of 5.4 and maximum 7.0.

2.05 SOIL AMENDMENT MATERIALS

A. Fertilizer for Trees and Shrubs: Containing fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, to the following proportions:
   1. Nitrogen: >20% (of which 50% will be organic).
   2. Phosphoric Acid: 10%.
   3. Soluble Potash: 5%.

2.06 MULCH MATERIALS

A. Organic Mulch: free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:
   1. Soil Pep: placed at perennial and surface-rooting ground cover locations.
   2. Bark: Long strand, shredded bark at tree, shrub, and groundcover locations not specified above to receive soil pep.

B. Pea Gravel: N/A

C. Cobble: Color and size noted on approved drawings.

2.07 ACCESSORIES

A. Weed Control Barrier: N/A

B. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's instructions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine areas to receive landscaping for compliance with requirements and for conditions affecting performance of work of this section. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Verify that prepared subsoil and planters are ready to receive work.

C. Saturate soil with water to test drainage.

3.02 PREPARATION OF SUBSOIL

A. Prepare subsoil to eliminate uneven areas. Maintain profiles and contours. Make changes in grade gradual. Blend slopes into level areas.

B. Remove stones larger than 1 inch in any dimension, foreign materials, sticks, rubbish, weeds and undesirable plants and their roots. Remove contaminated subsoil.

C. Scarify subsoil to a depth of 12 inches (150 mm) where plants are to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil. Ensure planter islands and construction vehicle routes are loosened prior to topsoil to support healthy root growth.

3.03 PLACING TOPSOIL

A. Topsoil depth shall be a minimum of 12 inches.

B. Spread topsoil to a minimum depth of 6 inches (150 mm) over area to be planted. Work into top of loosened sub grade to create a transition layer and then place remainder of planting soil mixture.

C. Till soil in beds to a minimum depth of 8 inches and mix with specified soil amendments and fertilizers.

D. Place topsoil during dry weather and on dry unfrozen subgrade.

E. Remove vegetable matter and foreign non-organic material from topsoil while spreading.

F. Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.

3.04 FERTILIZING

A. Apply fertilizer in accordance with manufacturer's instructions.

B. Apply after initial raking of topsoil and till in to beds.

C. Mix thoroughly into upper 8 inches (203 mm) of topsoil.

D. Lightly water to aid the dissipation of fertilizer.

3.05 EXCAVATION FOR TREES AND SHRUBS

A. Pits and Trenches: Excavate with bottom of excavation slightly raised at center to assist drainage. Loosen hard subsoil in bottom of excavation.
   1. Balled and Burlapped Trees and Shrubs: Excavate approximately 3 times as wide as ball diameter and equal to ball depth.
   2. Container-Grown Trees and Shrubs: Excavate as specified for balled and burlapped stock adjusted to size of container width and depth.

B. Dispose of subsoil removed from landscape excavations. Do not mix with planting soil or use as backfill.

C. Obstructions: Notify landscape architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

D. Drainage: Notify landscape architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.

E. Fill excavation with water and allow to percolate out before placing setting layer and positioning trees and shrubs.

3.06 PLANTING

A. Layout individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, and secure landscape architects acceptance before the start of planting work. Make minor adjustments as needed.

B. Set balled and burlapped stock plumb and in center of pit or trench with top of ball raised above adjacent finish grades as indicated.
   1. Place stock on undisturbed or compacted topsoil.
   2. Remove all burlap and wire baskets from balls. Remove pallets, if any, before setting. Do not use planting stock if ball is cracked or broken before or during planting operation.
   3. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets.
   4. Backfill to consist of one (1) part topsoil and one (1) part native soil clean and free from toxic mineral and chemicals, noxious weeds, rocks larger than 1-1/2 inch in any dimension, and other objectionable materials.
   5. When pit is approximately 1/2 backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing and tamping final layer of backfill.

C. Set container-grown stock plumb in center of pit or trench with top of ball raised above adjacent finish grades as indicated.
   1. Carefully remove containers so as not to damage root balls.
   2. Place stock on undisturbed or compacted topsoil.
   3. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets.
   4. Backfill to consist of one (1) part topsoil and one (1) part native soil clean and free from toxic mineral and chemicals, noxious weeds, rocks larger than 1-1/2 inch in any dimension, and other objectionable materials.
   5. When pit is approximately 1/2 backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing and tamping final layer of backfill.

D. Dish and tamp top of backfill to form a 3 inch high mound around the rim of the pit. Do not cover top of root ball with backfill.

3.07 MULCHING

A. Mulch backfilled surfaces of pits, trenches, planted areas, and other areas indicated.

B. Weed Control Barriers: N/A

C. Place soil pep mulch in all shrub and perennial locations.

D. Organic Mulch: Apply the following average thickness of organic mulch and finish level with adjacent finish grades. Do not place mulch against trunks or stems.
   1. Thickness: 3 inches at shrub and perennial locations.

E. Pea Gravel: N/A

F. Cobble: Place 3 inch depth cobble in areas as shown on plans with weed control barrier beneath.

3.08 ACCESSORIES

A. Apply antidesiccant using power spray to provide an adequate film or trunks, branches, stems, twigs, and foliage. When deciduous trees or shrubs are moved in full-leaf, spray with antidesiccant at nursery before moving and again 2 weeks after planting.

3.09 PLANT SUPPORT

A. Brace plants vertically with plant protector wrapped guy wires and stakes to the following:
   1. Tree Caliper: 2 to 4 inches (50 to 100 mm); Tree Support Method: 3 guy wires

3.10 TREE PRUNING

A. Prune trees as recommended in ANSI A300 Part 1.

B. Unless otherwise directed by landscape architect, do not cut tree leaders, remove only dead, broken, and split branches.

C. Prune shrubs to retain natural character. Shrub sizes indicated are size after pruning.

3.11 FIELD QUALITY CONTROL

A. Plants will be rejected if a ball of earth surrounding roots has been disturbed or damaged prior to or during planting.

3.12 CLEAN-UP AND PROTECTION

A. During landscaping, keep pavement clean and work area in orderly condition.

B. Protect landscaping from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

3.13 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the owner's property.

3.14 MAINTENANCE

A. Provide maintenance at no extra cost to Owner; Owner will pay for water.

B. Maintain plant life for 60 days after Date of Substantial Completion.

C. Irrigate sufficiently to saturate root system and prevent soil from drying out.

D. Remove dead or broken branches and treat pruned areas or other wounds.

E. Neatly trim plants where necessary.

F. Immediately remove clippings after trimming.

G. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions.

H. Control insect damage and disease. Apply pesticides in accordance with manufacturer’s instructions.

I. Remedy damage from use of herbicides and pesticides.

J. Replace mulch when deteriorated.

K. Maintain wrappings, guys, and stakes. Repair or replace accessories when required.

END OF SECTION