PROJECT MANUAL

Jerome High School Track Replacement

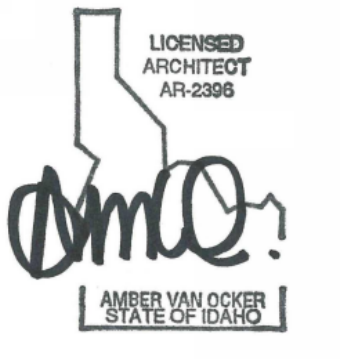
for

Jerome School District

BID SET
Volume One

March 6, 2025

LKV ARCHITECTS



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VOLUME 1

Refer to Starr Corporation Bidding Documents

DIVISION 01 – GENERAL REQUIREMENTS

DIVISION 11 - EQUIPMENT

DIVISION 31 – EARTHWORK

DIVISION 32 – EXTERIOR IMPROVEMENTS

DIVISION 33 – UTILITIES

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SECTION 011000 – SUMMARY OF WORK AND GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Access to site.
5. Coordination with Occupants.
6. Work restrictions.
7. Specification and Drawing conventions.
8. Miscellaneous provisions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

A. Project Identification: Jerome High School

1. Project Location: 104 N. Tiger Drive, Jerome, Idaho 83338

B. Owner: Jerome School District

1. Owner's Representative: Brian Bridwell, District Financial Administrator

C. Architect: LKV Architects

Project Architect: Amber Van Ocker

D. Architect's Consultants: Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

Civil Engineer:
The Land Group
462 East Shore Dr., Suite 100
Eagle, Idaho 83616
Phone: (208) 939-4041
Sergio Rangel
Email: serigo@thelandgroupinc.com

Landscape Architect:
The Land Group
462 East Shore Dr., Suite 100
Eagle, Idaho 83616
Phone: (208) 939-4041
Sean Conner
Email: sean@thelandgroupinc.com

E. Other Owner Consultants: Owner has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. Geotechnical Report: One Atlas, Twin Falls, Idaho.

F. Construction Manager: Starr Corporation
2995 E. 3600 N.
Twin Falls, Idaho 83301
Phone: (208) 731-5699
Michael Arrington
Email: michael@starrcorporation.com

1. Construction Manager has been engaged for this Project to serve as an advisor to Owner and to provide assistance in administering the Contract for construction between Owner and each Contractor, according to a separate contract between Owner and Construction Manager.

2. Starr Corporation is the Construction Manager / General Contractor (CMGC) for this project. The word "Contractor" in Division 1 Specification Sections shall apply to both the project CMGC and project subcontractors, as applicable. The word "Contractor" in all other Specification Sections shall apply to the respective subcontractor.

G. Web-Based Project Software: Project software administered by Construction Manager will be used for purposes of managing communication and documents during the construction stage.

1. See Section 013100 "Project Management and Coordination." for requirements for using web-based Project software.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. A complete replacement of the running track at the Jerome High School. Work shall include, but not be limited to, earthwork, grading and drainage, asphalt paving, concrete flatwork and curbing, synthetic running track surfacing, landscaping and associated athletic components all as shown, specified and detailed in the Contract Documents.

B. Type of Contract:

1. Project will be constructed under coordinated, concurrent multiple contracts. See the individual Bid Package Summary for a description of work included under each of the multiple contracts.

1.5 PHASED CONSTRUCTION

A. The Work shall be conducted in a single phase and completion schedules as outlined in the Project Construction Schedule.

B. Before commencing Work of each phase, submit an updated copy of Contractor's construction schedule showing sequence, commencement, and completion dates, and move-out and move-in dates of Owner’s personnel as applicable.

1.6 OWNER-FURNISHED PRODUCTS

A. Owner will furnish products indicated. The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products.

B. Owner-Furnished Products:

1. No identified Owner furnished products.

1.7 ACCESS TO SITE

A. General: Each Contractor shall have limited use of Project Site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Use of Site: Limit use of Project Site to areas within the Contract limits indicated. Do not disturb portions of project site or building beyond areas in which the Work is indicated.

1. Driveways, Walkways and Entrances: Keep driveways parking areas, loading areas, and entrances serving premises clear and available to the Owner and Construction Manager. Do not use these areas for parking or for storage of materials.

    a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
    b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Condition of Existing Building and Grounds: Maintain portions of existing building, grounds, landscaping, and hardscaping beyond that affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.8 COORDINATION WITH OWNER OCCUPANTS

A. Owner Limited Occupancy of Portions of existing Campus and Completed Areas of Construction: Owner reserves the right to utiliz portions of site not undergoing major modifications. Protection of the existing campus, buildings, and site improvements shall be protected as necessary by the Contractor. The Owner further reserves the right to occupy and to place and install equipment in completed portions of the Work prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.9 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

2. Comply with limitations set by Owner on access to, use of, and work in portions of the building at specified times and for specified periods.

B. On-Site Work Hours: Limit work to normal business working hours of 7:00 a.m. to 6:00 p.m., Monday through Friday, unless otherwise indicated.

1. Weekend Hours: As approved by the Owner and Construction Manager.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Construction Manager and Owner not less than two days in advance of proposed utility interruptions.
2. Obtain Construction Manager's and Owner's written permission before proceeding with utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

1. Notify Construction Manager and Owner not less than two days in advance of proposed disruptive operations.
2. Obtain Construction Manager's and Owner's written permission before proceeding with disruptive operations.

E. Restricted Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

F. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

G. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.

1.10 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

D. Requirements of Drawings and Specifications: All items of Work shown or noted on the Drawings and / or described in the Project Manual shall be provided by the Contractor as a part of his Work. Should an item be shown or noted on the Drawings and not described in the Project Manual, the Contractor shall provide the item at no additional cost to the Owner. Should an item be described in the Project Manual and not shown or noted on the Drawings, the Contractor shall provide the item at no additional cost to the Owner.

1.12 WORK NOT NOTED, DETAILED, OR SPECIFIED

A. All work required for a complete installation or assembly shall be included in the Contractor's bid. Where minor portions of required work are not noted, detailed or specified, such work shall be done in accordance with proven construction practice, industry standards, or as directed by Architect. Such required work shall be done at no additional cost to Owner.

1.13 DIMENSIONS AND MEASUREMENTS

A. Contractor shall field verify all dimensions pertaining to the work and shall be responsible for the determination of all quantities of materials required for the work and for the accuracy of all dimensions of materials and items fabricated for this project. Contractor shall not rely on the scale drawings in the project Drawings in the determination of exact quantities or dimensions.

1.14 GENERAL INSTALLATION PROVISIONS

A. Inspection of Conditions: Contractor shall inspect both the substrate and conditions under which Work is to be performed. Installation of affected components shall not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Manufacturer's Instructions. Contractor shall comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

C. Contractor shall inspect materials or equipment immediately upon delivery and prior to installation and shall reject damaged and defective items.

D. Contractor shall provide all attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.

E. Visual Effects: Contractor shall provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to Architect for final decision.

F. Contractor shall check and recheck measurements, dimensions, and elevations before starting each installation and shall be responsible for the accuracy of all measurements, dimensions, and elevations.

G. Contractor shall install each component during acceptable weather conditions.

1.15 CLEANING AND PROTECTION

A. During handling and installation, The Contractor shall clean and protect construction in progress and adjoining materials in place. Apply protective coverings where required to ensure protection from damage or deterioration at Substantial Completion.

B. The Contractor shall clean and maintain completed construction as frequently as necessary through the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

C. Limiting Exposures: The Contractor shall supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging or otherwise deleterious exposure from any source during the construction period.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

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SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Listed Alternates shall be accepted in any order determined by the Owner.

E. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

Alternate No. 1: Provide a complete price to provide and install the Synthetic Running Track Surfacing as specified in Specification Section 321824 – Bid Alternate. Refer to the Land Groups drawings and specifications.

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

1. Section 012300 "Alternates" for products selected under an alternate.
2. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form acceptable to Architect.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.

c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Substitution request is fully documented and properly submitted.
c. Requested substitution will not adversely affect Contractor's construction schedule.
d. Requested substitution has received necessary approvals of authorities having jurisdiction.
e. Requested substitution is compatible with other portions of the Work.
f. Requested substitution has been coordinated with other portions of the Work.
g. Requested substitution provides specified warranty.
h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed Requests received after that time may be considered or rejected at discretion of Architect.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
b. Requested substitution does not require extensive revisions to the Contract Documents.
c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
d. Substitution request is fully documented and properly submitted.
e. Requested substitution will not adversely affect Contractor's construction schedule.

f. Requested substitution has received necessary approvals of authorities having jurisdiction.
g. Requested substitution is compatible with other portions of the Work.
h. Requested substitution has been coordinated with other portions of the Work.
i. Requested substitution provides specified warranty.
j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

1.3 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
c. Include costs of labor and supervision directly attributable to the change.
d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 01 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use AIA Document G709 for Contractor Proposals, initiated proposals.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on form provided by Owner.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on form provided by Owner. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

a. Application for Payment forms with Continuation Sheets.
b. Submittals Schedule.
c. Contractor's Construction Schedule.

2. Submit the Schedule of Values to Architect through the Construction Manager at earliest possible date but no later than seven days before the date scheduled for submittal of initial Application for Payment.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:

a. Project name and location.
b. Name of Architect.
c. Architect's project number.
d. Contractor's name and address.
e. Date of submittal.

2. Submit draft of AIA Document G703 Continuation Sheets or other equivalent form approved by Architect and Owner.
3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

    a. Related Specification Section or Division.
    b. Description of the Work.
    c. Change Orders (numbers) that affect value.

        1) Change Orders shall be fully executed with all necessary signatures before they are included in the Schedule of Values.
        2) Construction Change Directive cost changes shall be incorporated into fully executed Change Order (s) before they are included in the Schedule of Values.

    d. Dollar value.

        1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

    a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing.

7. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Provide a separate line item for the value of project closeout activities.
9. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

10. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and Construction Manager and paid for by Owner.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: Progress payments shall be submitted to Architect on or before the agreed date of each month. The period covered by each Application for Payment is one month, ending on the last day of the month.

C. Payment Application Forms: Use AIA Document G702 or other equivalent form approved by Owner, Construction Manager and Architect.

1. Entries on continuation sheet shall be consistent with approved Schedule of Values.

D. Application Preparation: Complete every entry on form. Execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incorrect or incomplete applications without action.

1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders issued before last day of construction period covered by application.

E. Transmittal: Submit one signed original copy of each Application for Payment to Architect by a method ensuring receipt within 24 hours.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

F. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Products list.
5. Submittals Schedule (preliminary if not final).
6. List of Contractor's staff assignments.
7. List of Contractor's principal consultants.

G. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete, less the value of project closeout activities.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

H. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following on forms acceptable to Owner.

1. Evidence of completion of Project closeout requirements.
2. Contractor's Affidavit of Payment of Debts and Claims.
3. Release of Claims.
4. Consent of Surety to Final Payment.
5. Evidence that claims have been settled.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 CONTRACT DESCRIPTION

A. This section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:

1. Coordination.
2. Administrative procedures.
3. Organization of construction documents.
4. RFI's (Request for Information)
5. Digital project management procedures.
6. Preconstruction and site mobilization meeting
7. Progress meetings.
8. Preinstallation meeting.
9. General installation provisions.

B. Related Sections:

1. Section 017300 – Execution Requirements
2. "Individual Bid Packages" for a description of the division of work among separate contracts and coordination activities.
3. Section 017700 – Closeout Procedures for coordinating closeout of the Contract.

1.3 COORDINATION

A. Coordination: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.

1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. In finished areas except as otherwise indicated, conceal pipes, ducts and wiring within the construction. Coordinate locations of fixtures and outlets with finished elements.

B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service operating equipment.

C. Coordinate space requirements, supports, and installation of mechanical and electrical work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit as closely as practical; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

E. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules.
2. Preparation of schedule of values.
3. Installation and removal of temporary facilities.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project close-out activities.
8. Startup and adjustment of systems.

F. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

G. Division of Specifications and Drawings: The Contract Specifications and Drawings are divided into Sections, and the keynote reference numbers are related to the Specification Section numbering system, for the convenience of the Contractor. These divisions and keynoting systems are not for the purpose of apportioning work or assigning responsibility among subcontractors, suppliers and manufacturers, and shall not relieve the Contractor of the responsibility for fully coordinating the completion of all Work as shown.

1.4 MECHANICAL AND ELECTRICAL COORDINATION

A. Under the overall direction of the Construction Manager (CMGC), the HVAC Contractor on this project shall assume leadership in the installation coordination of all mechanical subcontract work (plumbing, fire sprinkler, air distribution, sheet metal, insulation, balancing and controls, etc.). The HVAC Contractor shall be responsible for coordination between these trades to make sure that the necessary interface between the different mechanical subs is in place, assuring that installation of the above systems can be installed in a manner that does not jeopardize the proper functioning of other systems, and that the required spacial requirements, clearances, maintenance access, piping gradients, etc. for each of the above systems is provided for and maintained.

B. Coordination of Space:

1. The Project Manager and HVAC contractor shall conduct a mechanical pre-installation conference for the purpose of coordinating the placement, arrangement, and elevation of mechanical equipment, piping systems, cable trays, conduit, etc. in ceilings, chases, and wall cavities. The project Mechanical Engineer and Electrical Contractor shall participate in this meeting along with all applicable mechanical trades.

2. Coordinate use of project space, avoidance of structural and architectural elements, and sequence of installation of fire suppression, plumbing HVAC, communications, security and all other electrical work which is indicated diagrammatically on Drawings. Follow routings shown for pipes, ducts and conduits as closely as practicable, with due allowance for available physical space; make runs parallel with lines of building. Utilize space efficiently to maximize accessibility for other installations, for maintenance and for repairs.
3. In finished areas, except as otherwise shown, conceal pipes, ducts, wiring and the like in the construction, coordinate locations of fixtures and outlets with finish elements.

C. Resolve all "tight" or restricted conditions involving work of various sections in advanced of installation of mechanical and electrical work.

D. Prior to proceeding with work in these areas, Contractor shall be responsible for preparing supplementary drawings for review showing all Work in "tight" areas, and provide minor adjustments and work adjustments as necessary to overcome "tight" conditions, at no increase in Contract Sum. "Tight" areas shall be identified by the Contractor; however, the Owner and Architect reserve the right to require supplementary drawings for any areas materially or visually affected by the construction activity whether or not identified as "tight" by the Contractor. ("Tight" shall be defined here as "a condition so close in structure as to prevent passage; allowing little or no room for free motion or movement, or unable to be concealed by specified finishes .")

1.5 INTERFERENCES & RIGHT-OF-WAY

A. Make proper provisions to avoid interferences. Where conflicts occur, architectural and structural has right-of-way over mechanical and electrical work; concealed mechanical work has right-of-way over concealed electrical work; exposed electrical fixtures have right-of-way over mechanical fixtures.

B. Submit conflicts which cannot be resolved by right-of-way to the A/E for direction.

C. Submit reflected ceiling coordination plans showing work by all applicable trades for review and approval by the Architect.

D. Submit wall coordination plans showing work by all applicable trades for review and approval by the Architect.

E. Submit floor/slab coordination plans showing work by all applicable trades for review and approval by the Architect.

1.6 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

B. The Mechanical/Electrical coordination process shall be performed on site at the Contractor's field office. The following parties shall be directly involved and participate, under the direction of the General Contractor (CMGC), on regularly scheduled weekly basis: Contractor, Plumbing subcontractor, HVAC subcontractor, Fire Protection subcontractor, Electrical subcontractor, Automatic Temperature Control System subcontractor, and Low Voltage Electrical Systems subcontractor. Additional subcontractors and vendors shall participate at various times as required: Masonry and Structural Steel subcontractors, Drywall and Ceiling subcontractors, and others as required.

C. Each trade's superintendent is expected to participate in the development of coordination drawings. All piping and equipment shall be shown, and all piping greater than 4 inches shall be indicated in double line fashion on the coordination drawings.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
b. Coordinate the addition of trade-specific information to coordination drawings in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
f. Indicate required installation sequences.
g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

1.7 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified to the Construction Manager.

1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner so as 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 Architect and Construction Manager.
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: AIA Document G716 or a Software-generated form with substantially the same content as indicated above, acceptable to Architect.

1. Attachments shall be electronic files in PDF format.

D. Architect's and Construction Manager's Action: Architect and Construction Manager will review each RFI, determine action required, and respond. Allow seven working days for 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. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect or Construction Manager of additional information.
3. 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.

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Construction Manager in writing within 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.

1.8 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Use of Architect's Digital Data Files: Digital data files of Architect's CAD drawings will be provided by Architect for Contractor's use during construction.

1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project record Drawings.
2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
3. Contractor shall execute a data licensing agreement in the form of AIA Document C106 Digital Data Licensing Agreement

    a. Subcontractors, and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of AIA Document C106.

B. Web-Based Project Software: Use Construction Manager's web-based Project software site “Procore” or similar software for purposes of hosting and managing Project communication and documentation until Final Completion.

1. Web-based Project software site includes, at a minimum, the following features:

    a. Compilation of Project data, including Contractor, subcontractors, Architect, architect's consultants, Owner, and other entities involved in Project. Include names of individuals and contact information.
    b. Access control for each entity for each workflow process, to determine entity's digital rights to create, modify, view, and print documents.
    c. Document workflow planning, allowing customization of workflow between project entities.
    d. Creation, logging, tracking, and notification for Project communications required in other Specification Sections, including, but not limited to, RFIs, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders.
    e. Track status of each Project communication in real time, and log time and date when responses are provided.
    f. Procedures for handling PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
    g. Processing and tracking of payment applications.
    h. Processing and tracking of contract modifications.
    i. Creating and distributing meeting minutes.

j. Document management for Drawings, Specifications, and coordination drawings, including revision control.
k. Management of construction progress photographs.
l. Mobile device compatibility, including smartphones and tablets.

C. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.9 PRECONSTRUCTION AND SITE MOBILIZATION MEETING

A. The Construction Manager will schedule meeting after Notice of Award.
B. Approved safety programs must be submitted and on site prior to mobilizing.
C. Attendance Required: Owner, Architect, Construction Manager, special consultants, Contractor, Contractor's superintendent, and major subcontractors.
D. Agenda:

1. Introduction of personnel representing the parties in Contract.
2. Use of premises by Owner and Contractor.
3. Owner's requirements and partial occupancy.
4. Construction facilities and controls provided by Owner.
5. Temporary utilities provided by Owner
6. Survey and building layout.
7. Security and housekeeping procedures.
8. Submission of schedule of values and progress schedule.
9. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
10. Procedures for testing.
11. Procedures for maintaining record documents.
12. Requirements for start-up of equipment.
13. Inspection and acceptance of equipment put into service during construction period.

E. Construction Manager will record minutes and distribute copies within two days after Meeting to participants, with copies to Architect, Owner, and those affected by decisions made.

1.10 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at monthly intervals, or more frequently if deemed necessary.

B. Construction Manager will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.

C. Attendance Required: Job Superintendent, major contractors and suppliers, Owner,

Architect/Engineers, and Construction Manager, as appropriate to agenda topics for each meeting.

D. Agenda:

1. Review of Work completed and progress “job walk”.
2. Review minutes of previous meetings.
3. Review of Work progress.
4. Field observations, problems, and decisions.
5. Identification of problems impending planned progress.
6. Review of submittals schedule and status of submittals.
7. Review of off-site fabrication and delivery schedules.
8. Maintenance of progress schedule.
9. Corrective measures to regain projected schedules.
10. Planned progress during succeeding work period.
11. Coordination of projected progress.
12. Maintenance of quality and work standards.
13. Effect of proposed changes on progress schedule and coordination.
14. Other business relating to Work.
15. Schedule next meeting.

E. Construction Manager will record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, and those affected by decisions made.

1.11 PREINSTALLATION MEETINGS

A. Building Façade Meeting: Convene a preinstallation meeting at work site 2 weeks prior to commencing work related to the exterior “envelope” of the building. These elements include the exterior wall finish materials, roofing, flashings, control joints, expansion joints, decking details, all roof and wall penetrations. The Contractor shall prepare the appropriate details and shop drawings illustrating compliance with the Construction Documents. The Contractor shall submit these drawings/submittals to the Architect at least 2 weeks prior to this meeting.

B. When required in individual Specification Sections, convene preinstallation meeting at Project site prior to commencing work of specific Section.

C. Require attendance of parties directly affecting, or affected by, work of specific Sections.

D. Notify Architect 14 days in advance of meeting date.

E. Prepare agenda and preside at meeting.

1. Review conditions of installation, preparation, and installation procedures.
2. Review coordination with related work.

F. Record minutes and distributes copies within two days after meeting to participants, with copies to Architect, Owner, and those affected by decisions made.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS.

A. Inspection of Conditions: Require the installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

D. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.

E. Recheck measurements and dimensions before starting each installation.

F. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

G. Close openings in exterior surfaces to protect installed work from weather and extremes of temperature and humidity.

H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

END OF SECTION 013100

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SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

1.3 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and Construction Manager and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

    a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

4. Format: Arrange the following information in a tabular format:

    a. Scheduled date for first submittal.
    b. Specification Section number and title.
    c. Submittal Category: Action; informational.
    d. Name of subcontractor.
    e. Description of the Work covered.
    f. Scheduled date for Architect and Construction Manager final release or approval.
    g. Scheduled dates for purchasing.
    h. Scheduled date of fabrication.

i. Scheduled dates for installation.
j. Activity or event number.

1.4 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal:

1. Project name.
2. Date.
3. Name of Architect.
4. Name of Construction Manager.
5. Name of Contractor.
6. Name of firm or entity that prepared submittal.
7. Names of subcontractor, manufacturer, and supplier.
8. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier; and alphanumeric suffix for resubmittals.
9. Category and type of submittal.
10. Submittal purpose and description.
11. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
12. Drawing number and detail references, as appropriate.
13. Indication of full or partial submittal.
14. Location(s) where product is to be installed, as appropriate.
15. Other necessary identification.
16. Remarks.
17. Signature of transmitter.

B. Options: Identify options requiring selection by Architect.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect and Construction Manager on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. PDF Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

E. Submittals for Web-Based Project Software: Prepare submittals as PDF files, or other format indicated by Project software website.

1.5 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Web-Based Project Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Architect and Construction Manager reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required.
2. Resubmittal Review: Allow 7 days for review of each resubmittal.
3. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.

4. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal.

D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect and Construction Manager action stamp.

1.6 SUBMITTAL REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's catalog cuts.
    b. Manufacturer's product specifications.
    c. Standard color charts.
    d. Statement of compliance with specified referenced standards.
    e. Testing by recognized testing agency.
    f. Application of testing agency labels and seals.
    g. Notation of coordination requirements.
    h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

    a. Wiring diagrams that show factory-installed wiring.
    b. Printed performance curves.
    c. Operational range diagrams.
    d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data unless submittal based on Architect's digital data drawing files is otherwise permitted.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

    a. Identification of products.
    b. Schedules.
    c. Compliance with specified standards.
    d. Notation of coordination requirements.
    e. Notation of dimensions established by field measurement.
    f. Relationship and attachment to adjoining construction clearly indicated.
    g. Seal and signature of professional engineer if specified.

2. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).

C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Permanently attach label on unexposed side of Samples that includes the following:

a. Project name and submittal number.
b. Generic description of Sample.
c. Product name and name of manufacturer.
d. Sample source.
e. Number and title of applicable Specification Section.
f. Specification paragraph number and generic name of each item.

3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics, and identification information for record.
4. Web-Based Project Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.
5. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

6. Samples for Initial Selection: Submit manufacturer's physical color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

    a. Number of Samples: Submit one full physical set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

7. Samples for Verification: Submit full-size physical units or physical samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

    a. Number of Samples: Submit two sets of Samples. Architect and Construction Manager will retain one Sample set; remainder will be returned.

        1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
        2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit samples that show approximate limits of variations.

D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.

E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

G. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

H. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed

before installation of product, for compliance with performance requirements in the Contract Documents.

5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

    a. Name of evaluation organization.
    b. Date of evaluation.
    c. Time period when report is in effect.
    d. Product and manufacturers' names.
    e. Description of product.
    f. Test procedures and results.
    g. Limitations of use.

1.7 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

    1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

    1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.8 CONTRACTOR'S REVIEW

A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Contractor's Approval: Indicate Contractor's approval for each submittal with or indication in web-based Project software. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

1.9 ARCHITECT'S AND CONSTRUCTION MANAGER'S REVIEW

A. Action Submittals: Architect and Construction Manager will review each submittal, indicate corrections or revisions required.

1. PDF Submittals: Architect and Construction Manager will indicate, via markup on each submittal, the appropriate action.

2. Submittals by Web-Based Project Software: Architect and Construction Manager will indicate, on Project software website, the appropriate action.

B. Informational Submittals: Architect and Construction Manager will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect and Construction Manager will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect and Construction Manager.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Architect and Construction Manager will return without review submittals received from sources other than Contractor.

F. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect

C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.

D. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.

E. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

F. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

J. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades people of the corresponding generic name.

K. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Reports: Prepare and submit certified written reports FOR contractor provided tests and inspections that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed

for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and regulations governing the Work.

G. Testing Agency Qualifications: An independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

a. Provide test specimens representative of proposed products and construction.
b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, Owner, and Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.

2. Notify Architect ten days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.

    a. Allow ten days for initial review and each re-review of each mockup.

5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated.

1.7 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.

B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

    a. Contractor’s testing agency shall be acceptable to Owner and Architect.
    b. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."

D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel but not less than 24 hours in advance of operations requiring tests and inspections. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.8 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency and / or special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.

2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
2. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

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SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": 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.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Related Sections include the following:

1. Divisions 2 through 33 for specific requirements for products in those Sections.

1.2 DEFINITIONS

A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weather-tight; exterior walls are insulated and weather-tight; and all openings are closed with permanent construction or substantial temporary closures.

1.3 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:

1. Owner’s construction forces.
2. Occupants of Project.
3. Architect.
4. Testing agencies.
5. Personnel of authorities having jurisdiction.

B. Sewer Service: Owner will pay sewer-service use charges for sewer usage by all entities for construction operations.

C. Water Service: Owner will pay water-service use charges for water usage by all entities for construction operations. This does not include water conveyed by water truck for sitework use.

D. Electric Power Service: Owner will pay electric power-service use charges for electricity usage by all entities for construction operations.

1.4 QUALITY ASSURANCE

A. Standards: Comply with ANSI A10.6, NECA’s “Temporary Electrical Facilities,” and NFPA 241.

1. Trade Jurisdictions: Assigned responsibilities for installation and operation of

temporary utilities are not intended to interfere with trade regulations and union jurisdictions.

2. Electrical Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. If required, install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

A. Temporary Utilities: At earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of permanent service.

1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:

1. Keep temporary services and facilities clean and neat.
2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 – PRODUCTS

2.1 MATERIALS

A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Architect. Provide materials suitable for use intended.

2.2 EQUIPMENT

A. General: Provide equipment suitable for use intended.

B. Field Offices and Sheds: Will not be allowed on site without approval of the Construction Manager. Locate as per the direction of the Construction Manager.

C. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.

1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

D. Drinking Water Fixtures: Bottled water drinking water units including paper cup supply.

1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 degrees F.

E. Heating Equipment: Use of permanent heating systems within the building shall not be used during the course of construction. Freeze protection throughout the building, and heat required to maintain temperatures required for specific types of work, shall be provided by means of vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic controls.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.

F. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110-to 120-V plugs into higher voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.

G. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3 – EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are not longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITIES

A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.

1. Provide adequate capacity at each stage of construction.

B. Water Service:

1. Owner will pay cost of temporary water. Exercise measures to conserve water. Utilize Owner’s existing water system, extend and supplement with temporary devices as needed to maintain specified conditions for construction operations.

2. Contractor shall pay to extend branch piping with outlets, if required, located so water is available by hoses with threaded connections for individual use. Provide temporary pipe insulation to prevent freezing.
3. Provide rubber hoses as necessary to serve Project site.

C. Sanitary Facilities: The Construction Manager shall provide and maintain temporary toilets and wash facilities.

D. Heating and Ventilation: The Construction Manager shall provide temporary heating units and ventilating fans as required for curing or drying of completed installation or for protecting installed construction from adverse effects of low temperatures or high humidity, or to prevent the accumulation of dust, fumes, vapors or gases. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed.

1. Maintain a minimum temperature of 50 degrees F in permanently enclosed portions of building for normal construction activities, and 65 degrees F for finishing activities and areas where finished Work has been installed.

E. Electrical Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear.

1. The Electrical Contractor will provide a temporary power source at the project site and a distribution system to the new building area and the staging area from the temporary power source.
2. The voltage provided at point of distribution will be 120/208, single phase, except as noted in electrical drawings for provision of temporary power when modifying electrical.
3. All Contractors shall provide their own UL approved extension cords and any adapters required.
4. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
5. All Contractors shall provide supplementary electrical power to handle welding machines or furnish gasoline operated welders, at their option.
6. Contractor shall provide labor to relocate, as required, distribution boxes to each desired location. Each re-location is subject to the Construction Manager's approval.

F. Lighting:

1. The Construction Manager shall provide temporary light strings for general lighting purposes. Lamps will be furnished, installed and maintained by the Electrical Contractor. The Electrical Contractor shall provide labor for installing and moving light strings to desired locations. Each new location is subject to the Construction Manager's approval. The above CM-provided lighting is for

minimal general illumination only. Each contractor shall provide all required work lighting in sufficient quantity and quality to adequately execute the work.

2. Specifically, the Contractors responsible for the execution of the work which will affect the final appearance of surfaces (i.e., CMU, gypsum, drywall, lath and plaster, painting, etc.) shall provide rolling lighting assemblies sufficient to deliver 50 foot candles of illumination on these surfaces while work is actually in progress.
3. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
4. Maintain lighting in corridors and hallways during normal construction time frames to ensure safe routes of passage.

G. Telephone Service: The Construction Manager shall provide Contractor's telephone service at the Construction Manager's field office for local telephone calls. Long distance calls will be permitted provided the charges are reversed or are previously approved and paid for by the party originating the call. Other telephone services are the responsibility of the Contractor.

H. Facsimile: Provide for facsimile service and a dedicated telephone line to field office at time of project mobilization.

3.3 SUPPORT FACILITIES

A. General: Comply with the following:

1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Dewatering Facilities and Drains: Comply with requirements in applicable Division 2 Sections for temporary drainage and dewatering facilities and operations not directly associated with construction activities included in individual Sections. Where feasible, use same facilities. Maintain project site, excavations, and construction free of water.

1. Grade site to drain. Provide, operate, and maintain pumping equipment.
2. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

C. Erosion and Sediment Control:

1. Contractor shall plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
2. Minimize surface area of bare soil exposed at one time.
3. Provide temporary measures including berms, dikes, drains, and other devices to prevent water flow.

4. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
5. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

D. Storm Water Control: Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

E. Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes indicated. Install signs to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs.

1. Engage an experienced sign painter to apply graphics for Project identification signs. Comply with details indicated at the end of this Section.
2. Prepare temporary signs to provide directional information to construction personnel and visitors.
3. Construct signs of exterior type Grade B-B high density concrete form overlay plywood in sizes and thickness indicated. Support on posts or framing of preservative-treated wood or steel.
4. Paint sign panel and applied graphics with exterior grade alkyd gloss enamel over exterior primer.
5. All signage requires approval of Construction Manager prior to installation.

F. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations.

G. Field Surveying and Layout: The Owner, through the Construction Manager will provide overall initial layout of building structures and overall control information including building corner points, floor elevation, parking lot edges, asphalt grade breaks, and location of major utility locations as shown on the drawings. Detailed surveying required by each Contractor for his own work will be the responsibility of that Contractor. Any staking destroyed by Contractor's activities must be promptly re-staked and shall be the responsibility of that Contractor to replace.

3.4 SECURITY AND PROTECTION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination, pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.

B. Security Enclosure and Lockup: Contractor shall be responsible for and provide security program during the construction period.

1. Protect Work and existing premises from theft, vandalism, and unauthorized entry.
2. Initiate program at project mobilization.

3. Maintain program throughout construction period until Owner occupancy.

C. Security Restrictions:

1. Do not work on Saturdays, Sundays, or Holidays without Construction Manager approval.

D. Barricades, Warning Signs, and Lights: Contractor shall provide barriers to prevent unauthorized entry to construction areas and protect existing facilities and adjacent properties from damage from construction operations. Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing warning lights.
1. Contractor shall provide 6' high fence around their individual construction staging site, equip with vehicular and pedestrian gates with locks.
2. Contractor shall be responsible for protection of their stored materials on site.
3. Contractor shall provide protection for non-owned vehicular traffic, stored materials, site, and structures from damage.
4. Contractors are responsible for fall protection for their portions of work, including but not limited to safety lines, railings and warning signs.

E. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather tight enclosure for building exterior.

1. The Owner through the Construction Manager will provide and direct the installation of temporary enclosures where needed for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
2. Vertical openings: Close openings of 25 sq. ft. or less with plywood or similar materials.
3. Horizontal openings: Close openings in floor or roof decks and horizontal surfaces with load-bearing, wood framed construction.
4. Install tarpaulins securely using fire-retardant-treated wood framing and other materials.

F. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.

    a. Field Offices: Class-A stored-pressure water-type extinguishers.
    b. Other Locations: Class ABC dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for exposures.
    c. Locate fire extinguishers where conventional and effective for their intended purpose.

2. Store combustible materials in containers in fire-safe locations.
3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities and other access routes for firefighting. Prohibit smoking on school property.
4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
5. Permanent Fire Protection: At earliest feasible date in each area of Project, complete installation of permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.
6. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

G. Provide protection for plant life designated to remain. Replace damaged plant life.

3.5 DUST CONTROL

A. Contractor shall execute Work by methods to minimize raising dust from construction operations.

B. Provide positive means to prevent air-borne dust from dispersing into atmosphere

3.6 PARKING

A. Construction personnel parking is to be provided by Owner and shall be located as per the Construction Manager.

B. Do not allow heavy vehicles or construction equipment in finished parking areas.

C. Permanent Pavements And Parking Facilities:

1. Prior to Substantial Completion, bases for permanent roads and parking areas may be used for construction traffic.
2. Avoid traffic loading beyond paving design capacity. Tracked vehicles not allowed.

E. Maintenance: Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, and ice.

F. Mud From Site Vehicles: Contractor to provide means of removing mud from vehicle wheels before entering streets.

4.7 TRAFFIC REGULATIONS, SIGNS AND SIGNALS

A. Contractor shall be responsible for traffic regulation; and when required, provide a written traffic plan.

1. Post Mounted and Wall Mounted Traffic Control and Informational Signs: As approved by authority having jurisdiction.
2. Automatic Traffic Control Signals: As approved by local jurisdictions.
3. Traffic Cones and Drums, Flares and Lights: As approved by authority having jurisdiction.
4. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.
5. Flares and Lights: Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.
6. Haul Routes: Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.
7. Provide signs at approaches to site and on site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
8. Provide, operate, and maintain [automatic] traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations.
9. Relocate as Work progresses, to maintain effective traffic control.
10. Remove equipment and devices when no longer required at Substantial Completion.
11. Repair damage caused by installation.
12. Remove post settings.

4.8 ACCESS AND CONSTRUCTION AIDES

A. Roof Top Access: Access to all areas will be the responsibility of the Contractor requiring access. All vertical and horizontal access shall be maintained in a safe state, meeting OSHA standards for by Contractors requiring access.

B. Temporary Vertical Transportation: Contractor shall provide temporary ladders, ramps, material hoists, scaffolding, cranes and other devices required for the Work, including guys, bracing and other required devices.

3.9 PROGRESS CLEANING AND WASTE REMOVAL

A. Contractors shall be responsible for own waste removal/disposal and maintaining areas free of waste materials, debris and rubbish. Demolition materials are to be removed and disposed of in a legal manner by any contractor performing demolition work.

1. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

B. Contractors shall broom clean work areas daily.

C. If Contractor fails to clean up his work area in a timely and satisfactory manner after 24-hours notice, the Construction Manager will cause the clean up to be done by others at the expense of the Contractor.

3.10 PROTECTION OF INSTALLED WORK BY CONTRACTOR

A. Contractors to protect their installed Work and provide special protection where specified in individual Specification Sections. This includes covering work with visqueen or heat blankets to protect from freezing or adverse weather conditions. Owner will pay costs for tenting and heating of those elements.

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

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

D. 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.

E. Prohibit traffic across landscaped areas.

3.11 OPERATION, TERMINATION, AND REMOVAL

A. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
2. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

B. Temporary Facility Changeover: Except for using permanent fire protection as soon as available, do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the property of Contractor.
2. Remove underground installations to minimum depth of 2 feet. Grade site as indicated on Drawings.
3. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and

other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

4. Clean and repair damage caused by installation or use of temporary work.
5. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.
6. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1 Section "Closeout Procedures."

3.12 MISCELLANEOUS

A. Pets are not allowed on job-site.

B. Firearms are not allowed on job-site.

C. Loud or distractive music is not allowed on job-site. Contractors to comply with local noise ordinances to protect workers and public.

D. Smoking is unlawful on School Property.

E. Per Idaho Code 18-8329, the contractor will prohibit any persons in their employ who are registered or are required to register under the sex offender registration act from participation on this project if such participation would require them to enter upon school property.

END OF SECTION 015000

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SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and product substitutions.

B. Contractor shall incorporate into the Work only those products specified, indicated as basis-of-design products, those products approved in Addenda prior to bidding, or as approved after award of Contract under conditions set forth in Paragraphs 1.4 and 2.2 below.

1.3 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility**,** except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics.

1.4 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

    a. Statement indicating why specified material or product cannot be provided.
    b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
    c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    e. Samples, where applicable or requested.
    f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
    g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
    i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
    j. Cost information, including a proposal of change, if any, in the Contract Sum.
    k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
    l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 10 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 10 days of receipt of additional information or documentation, whichever is later.

    a. Form of Acceptance: Change Order.
    b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1. Contractor is responsible for providing products and construction methods compatible with all other products and construction methods of other contractors.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
3. Refer to Divisions 02 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 2 "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.

3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
8. Basis-of-Design Product: Where Specifications name a product, provide the specified product. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Products by other manufacturers are subject to approval prior to bidding.
9. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

    a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.

10. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.

    a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
    b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

A. Timing: Following award of Contract, Architect will consider requests for substitution for products specified, or approved by addendum under any or all of the following conditions:

1. The specified product cannot be provided within the Contract Time. The request will not be considered if the product cannot be provided as a result of the Contractor’s failure to pursue the Work promptly or coordinate activities properly.

2. The specified product cannot receive necessary approvals by governing authorities, and the requested substitution con be approved.
3. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.
4. The specified product cannot be provided in a manner that is compatible with other materials, or cannot be properly coordinated, warranted, or insured, and where the Contractor certifies that the substitution will overcome the deficiency.

B. By making a request for substitution, contractor warrants that:

1. Requested substitution does not require extensive revisions to the Contract Documents.
2. Requested substitution is consistent with the Contract Documents and will produce indicated results.
3. Substitution request is fully documented and properly submitted.
4. Requested substitution will not adversely affect Contractor's Construction Schedule.
5. Requested substitution has received necessary approvals of authorities having jurisdiction.
6. Requested substitution is compatible with other portions of the Work.
7. Requested substitution has been coordinated with other portions of the Work.
8. Requested substitution provides specified warranty.
9. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner's portion of the Work.
6. Coordination of Owner-installed products.
7. Progress cleaning.
8. Starting and adjusting.
9. Protection of installed construction.
10. Correction of the Work.

B. Related Requirements:

1. Section 011000 "Summary" for coordination of Owner-furnished products and limits on use of Project site.
2. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.

1.2 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.3 PREINSTALLATION MEETINGS

A. Cutting and Patching Conference: Conduct conference at Project site.

1. Prior to commencing work requiring cutting and patching, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and patching work. Inform Architect and Construction Manager of scheduled meeting. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:

a. Contractor's superintendent.
b. Trade supervisor responsible for cutting operations.

c. Trade supervisor(s) responsible for patching of each type of substrate.
d. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affected by cutting and patching operations.

2. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

B. Layout Conference: Conduct conference at Project site.

1. Prior to establishing layout of new and existing perimeter and structural column grid(s), review building location requirements. Review benchmark, control point, and layout and dimension requirements. Inform Architect and Construction Manager of scheduled meeting. Require representatives of each entity directly concerned with Project layout to attend, including the following:

a. Contractor's superintendent.
b. Professional surveyor and Contractor's personnel responsible for performing Project surveying and layout.

2. Review meanings and intent of dimensions, notes, terms, graphic symbols, and other layout information indicated on the Drawings.
3. Review requirements for including layouts on Shop Drawings and other submittals.
4. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.4 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.

B. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems**,** and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations. Record photographs shall be taken of all building and site areas to document pre-demolition and construction conditions.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.

2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect through Construction Manager in accordance with requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Architect and Construction Manager promptly.

B. Engage a land surveyor experienced in laying out the Work, using the following accepted surveying practices:

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish limits on use of Project site.
3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.
5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify Architect and Construction Manager when deviations from required lines and levels exceed allowable tolerances.
7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Construction Manager.

3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect or Construction Manager. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect and Construction Manager before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

3.5 INSTALLATION

A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb, and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces, unless otherwise indicated on Drawings.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.

F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.

G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

3.6 CUTTING AND PATCHING

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of Work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 011000 "Summary."

F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: 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.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

    a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 COORDINATION OF OWNER'S PORTION OF THE WORK

A. Site Access: Provide access to Project site for Owner's construction personnel and Owner's separate contractors.

1. Provide temporary facilities required for Owner-furnished, Contractor-installed and Owner-furnished, Owner-installed products.
2. Refer to Section 011000 "Summary" for other requirements for Owner-furnished, Contractor-installed and Owner-furnished, Owner-installed products.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel and Owner's separate contractors.

1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Preinstallation Conferences: Include Owner's construction personnel and Owner's separate contractors at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 PROGRESS CLEANING

A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

    a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 019113 "General Commissioning Requirements."

B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.11 CORRECTION OF THE WORK

A. Repair or remove and replace damaged, defective, or nonconforming Work. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

C. Restore permanent facilities used during construction to their specified condition.

D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

F. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final Completion procedures.
3. Warranties.
4. Final cleaning.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit preliminary manuals required by Specifications Section 017823 (two copies) for review by Architect.
13. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

14. Complete final cleaning requirements, including touchup painting.
15. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Submit copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit final manuals required by Specifications Section 017823, corrected in accordance with the Architect’s review of the preliminary operations and maintenance manuals submitted at the time of Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.
l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

    1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

m. Wipe surfaces of mechanical and electrical equipment**,** elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
n. Replace parts subject to unusual operating conditions.
o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
q. Clean ducts, blowers, and coils if units were operated without filters during construction.
r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
s. Leave Project clean and ready for occupancy.

C. Pest Control: Make a final inspection and rid Project of rodents, insects, and other pests.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Maintenance manuals for the care and maintenance of products, materials, finishes, systems and equipment.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 SUBMITTALS

A. Submittal: Submit two copies of each manual in preliminary form as a condition of Substantial Completion. Architect will return copies with required corrections indicated within 15 days after Substantial Completion.

1. Correct or modify each manual to comply with Architect's indicated corrections. Submit 2 copies of each corrected manual prior to Final Acceptance of the Work.
2. Corrected preliminary manuals may be used for final submittal.

1.5 COORDINATION

A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization: Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 MANUALS, GENERAL

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name, address, and telephone number of Contractor.
6. Name and address of Architect.
7. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

    a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
    b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

    a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions.
2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.

9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.4 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

1. Provide a summary list of all finish materials in manual at the front of the manual.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.

3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard printed maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training videotape, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.

1. Do not use original Project Record Documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared Record Drawings in Division 01 Section "Project Record Documents."

F. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

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SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

1.3 SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit two set(s) of marked-up Record Prints to Architect.

B. Record Specifications: Submit two copies of Project's Specifications, including addenda and contract modifications to Architect.

C. Record Product Data: Submit two copies of each Product Data submittal to Architect.

1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual in addition to submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an understandable drawing technique.
c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations below first floor.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directive.
k. Changes made following Architect's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings, completely and accurately.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect.
e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
5. Note related Change Orders, Record Product Data**,** and Record Drawings where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders**,** Record Specifications, and Record Drawings where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain copies of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION 017839

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SECTION 116833 – ATHLETIC FIELD EQUIPMENT

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes the following:

1. Track and Field Furnishing and Equipment

B. Related Sections include the following:

1. Division 01 Sections
2. Division 32 Section “Concrete Paving” for mounting furnishings

1.2 DEFINITIONS

A. AHJ – Authority Having Jurisdiction.

1.3 REFERENCES

A. ASTM A 53/A 53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2000.

B. ASTM A 283/A 283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2000.

C. ASTM A 325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2000.

D. ASTM A 325M - Standard Specification for High-Strength Bolts for Structural Steel Joints (Metric); 2000.

1.4 SUBMITTALS

A. See Division 1 for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product specified, including detailed installation diagrams and recommended installation methods.

C. Shop Drawings: Indicate all materials, dimensions, welds, finish, etc. for field fabricated items.

D. Operations & Maintenance Data: For site furnishings to include in O&M Manuals.

1.5 QUALITY ASSURANCE

A. Furnish paint for touch-up as required.

B. Install pre-manufactured items, poured-in-place or pre-cast items, and all related materials required to complete the work indicated on the drawings and/or specified.

C. Materials Inspection: The Contractor shall inspect all items upon delivery to ensure no damage to material or finish. Minor repairs and/or touch up shall be accepted only upon prior authorization from the landscape architect and shall conform, at minimum, to manufacturer's standards.

1.6 WARRANTY

A. Contractor shall warrant work as provided by the General and Supplementary Conditions and Division 01 Specifications.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Substitutions or equivalent products shall be in accordance with Division 01 Specifications.

2.2 SITE FURNISHINGS

A. Track and Field Furnishing and Equipment

1. Pole Vault:
   a. Standard Forming System
      1) Model: PVSFS. Manufacturer: Sportsfield Specialties. Contact: Alex Fletcher, 408-728-0482.
      2) Install per manufacturer specifications.
   b. Pole Vault Box
      1) Model: Cast Aluminum Vault Box with Lid. Color: White. Manufacturer: Sportsfield Specialties. Contact: Alex Fletcher, 408-728-0482.
      2) Install per manufacturer specifications.

2. Long Jump/Triple Jump:
   a. Take Off Board System
      1) Model: 4352S. Manufacturer: Gill Athletics. Contact: 800-637-3090.
      2) Install per manufacturer specifications.

   b. Jump Sand
      3) Manufacturer: Grass Roots Agronomics, Inc.. Contact: 208-365-1246.

B. ACCESSORIES

1. Provide all anchorage devices and materials required for complete installation.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

C. Install site furnishings level, plumb, true, securely anchored and positioned at locations indicated on Drawings.

D. Touch-up paint, as necessary, all blemishes incurred during shipping or assembly, color as designated, to manufacturer’s standards.

E. Reinstallation of existing items shall include the use of all required new fasteners, footings, etc. to result in a fully functional system. Provide touch-up paint as required.

3.3 ADJUSTING

A. Upon completion of the installation of site furnishings, check each item and verify that all equipment is properly installed; verify that all trim is in place; adjust all components as necessary to ensure proper operation; remove all labels from equipment.

B. Make necessary adjustments for safe, efficient and smooth operation.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products after Substantial Completion.

3.5 CLEANING

A. Remove all packing materials from job site.

B. Clean or restore marred surfaces.

END OF SECTION 116833

SECTION 311000 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Removing existing vegetation.
2. Clearing and grubbing.
3. Removing above- and below-grade site improvements.
4. Disconnecting, capping or sealing, protecting and abandoning site utilities in place.
5. Temporary erosion and sedimentation control measures.

B. Related Sections:

1. Division 01 Sections
2. Division 31 “Earth Moving”.
3. Idaho Standards for Public Works Construction, Current Edition.
4. Geotechnical Engineering Evaluation as prepared by Atlas Technical Consultants.

1.2 DEFINITIONS

A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.3 MATERIAL OWNERSHIP

A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site. Conform to applicable code for disposal of debris.

1.4 SUBMITTALS

A. Operations & Maintenance Data: Submit Record Drawings identifying and accurately showing locations of utilities and other subsurface structural, electrical, and mechanical conditions which have been retained, rerouted or abandoned.

1.5 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 Owner or authorities having jurisdiction.

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

C. Utility Locator Service: Notify Utility Notification Center for area where Project is located before beginning site clearing operations. Contact Idaho Utility Notification Center at (800)342-1585.

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

E. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist. Refer to Geotechnical Evaluation for Soft Subgrade Construction Approach Recommendations.

F. Dust Control: Per Agency Having Jurisdiction.

1.6 WARRANTY

A. Contractor shall warrant work as provided by the General and Supplementary Conditions and Division 01 Specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Division 31 Section "Earthmoving".

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 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 Construction Manager.

3.2 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 Agencies Having Jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

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

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

E. Coordinate with SWPPP drawings.

3.3 EXISTING UTILITIES

A. Contractor shall coordinate with Construction Manager to arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.

1. Arrange with utility companies to shut off indicated utilities.

C. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Construction Manager not less than two (3) days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Construction Manager's written permission.

D. Excavate for and remove underground utilities indicated to be removed. Backfill & compact excavated utility trenches per specification section 312000.

3.4 CLEARING AND GRUBBING

A. Remove trees, shrubs, and other vegetation to permit installation of new construction.

B. Remove obstructions, pipes, ditches, etc. to permit installation of new construction.

C. 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 6-Inches and compact each layer to a density equal to adjacent original ground.
2. All fill material placed must be compacted and tested. Coordinate with Construction Manager for testing.

3.5 TOPSOIL STRIPPING

A. Refer to Geotechnical Engineering Evaluation for additional information.

B. All topsoil, organic or disturbed soils on site shall be removed to a minimum depth of 1-foot and removed from site. Coordinate with Section 312000 for excavation depths.

C. Existing topsoil shall not be used as Structural Fill.

3.6 REMOVAL OF LEAN CLAY SOILS AND UNCONTROLLED FILL

A. Refer to Geotechnical Engineering Evaluation for additional information. Contractor shall remove to the minimum depth under pavement and track areas as indicated in the geotechnical report.

B. Following topsoil removal operations, contractor shall remove any remaining topsoil, all lean clay soils, and uncontrolled fill beneath proposed buildings, foundations and paved areas as required to achieve specified footing and pavement design depths. Use of excavated material is prohibited for use as fill and shall be removed from site.

C. Upon completion of subgrade, geotechnical engineer shall inspect sub grade conditions and determine if additional removal is necessary.

3.7 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

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 adjacent to line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.

2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.
3. Remove a minimum depth of 1-foot below slabs, curbs, gutters, asphalt, and concrete flatwork. Coordinate with Section 312000 for excavation depths.

C. If underground storage tanks, underground utilities, wells, or septic systems are discovered during construction activities, they must be decommissioned then removed or abandoned in accordance with governing Federal, State, and local agencies. Excavations developed as a result of such removal must be backfilled with structural fill materials. See section 312000.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

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.

B. 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. Do not interfere with other Project work.

END OF SECTION 311000

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SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavation and backfilling for slabs-on-grade, walks, pavements and landscape areas.
2. Excavation and backfilling for storm drainage systems.
3. Excavation and backfilling trenches for utilities and pits for buried utility structures.
4. Excavation and backfilling trenches where existing utilities are removed or modified.
5. Temporary erosion and sedimentation control measures.

B. Related Sections:

1. Division 01 Sections.
2. Division 23, 26, and 27 Sections for installing underground mechanical, electrical and telecommunications utilities and buried mechanical and electrical structures.
3. Division 31 Section "Site Clearing" for site stripping, grubbing, stripping topsoil, and removal of above- and below-grade improvements and utilities.
4. Division 32 Section "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.
5. Division 33 Sections for underground site utilities.
6. Idaho Standards for Public Works Construction, Current Edition.
7. Geotechnical Engineering Evaluation as prepared by Atlas Technical Consultants.

1.2 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe. Initial backfill shall be Bedding Course
2. Final Backfill: Backfill placed over initial backfill to fill a trench. Final Backfill shall be Bedding Course or Granular Structural Fill.

B. Base Course (Crushed Aggregate Base): Aggregate layer placed between the sub-base course and hot-mix asphalt paving or concrete flatwork or cast in place concrete.

C. Subbase Course (Structural Fill): Aggregate layer placed between the subgrade and Base Course.

D. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

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

F. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

G. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

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

I. 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.

J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, base course, or topsoil materials.

K. SWPPP: Storm Water Pollution Prevention Plan

L. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.3 SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Geotextiles and warning tapes.

B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 1557 (for rigid structures) or ASTM D 698 (for flexible pavements).
3. Sieve analysis for all structural fill materials.

C. Dewatering: Per ISPWC Section 205

D. Operations & Maintenance Data: Submit Materials Testing reports for compaction testing of all subgrades and fill materials.

1.4 QUALITY ASSURANCE

A. Pre-excavation Conference: Conduct conference at Project site.

B. All gravel, base course, subbase, and other imported fill materials other than landscape fill and topsoil shall only be stockpiled in proposed impervious areas. No gravel or rock materials shall be stockpiled or temporarily placed in proposed field/landscape areas in order to prevent landscape areas from being contaminated with rock materials. If landscape areas become contaminated, the contractor shall restore them to specified requirements at no cost to the Owner.

1.5 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earthwork 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 Owner or authorities having jurisdiction.

B. Utility Locator Service: Notify Utility Notification Center for area where Project is located before beginning site clearing operations. Contact local service at 811 or (800)342-1585.

C. Do not commence earthwork operations until temporary SWPPP measures are in place.

D. Soft Subgrade Conditions: This site consists of native silts and/or clays that are relatively high in moisture content and prone to pumping and rutting from rubber-tired construction equipment. Earth Moving methods which limit destabilizing areas of the site during earth moving activities shall be employed.

E. Construction operations during dry, warm weather conditions will help to limit development of unstable subgrade conditions. Construction during wet weather may not be possible, depending on the amount of precipitation.

F. Dust Control: Per Agency Having Jurisdiction.

1.6 WARRANTY

A. Contractor shall warrant work as provided by the General and Supplementary Conditions and Division 01 Specifications.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide imported borrow soil materials when sufficient satisfactory soil materials are not available from excavations. Materials shall comply with this specification.

B. Subbase Course (Granular Structural Fill):

1. Granular Structural Fill: 6-Inch minus select, clean, granular soil with no more than 50 percent oversize (greater than 3/4-Inch) material and no more than 12 percent fines (passing No. 200 sieve). Refer to the ISPWC Section 801 for material gradation and requirements.

C. Base Course (Crushed Aggregate Base):

1. 3/4" maximum size- complying with ISPWC Section 802 – 3/4-inch (Type I) for material gradation and requirements.

2. Crushed Aggregate Base as defined herein shall be used as Free Draining Granular Mat as indicated by the geotechnical engineering report.

D. Bedding Course: Type I bedding material Per ISPWC Section 305 – in compliance with the following material gradation:

Sieve Size	Percent Passing
1-inch	100
3/4-inch	80-100
3/8-inch	20-70
No. 4	5-20
No. 8	0-5
No. 200	0-3

E. Drain Rock: Per ISPWC Section 801 – in compliance with the following material gradation:

Sieve Size	Percent Passing
3-inch	100
1-inch	25-60
3/8-inch	0-4
No. 200	0-2

1. Drain rock shall provide a minimum of 35% void volume. Submit data to support required void space and gradation for approval.

F. Filter Sand: Per ISPWC Section 801 – in compliance with the following material gradation:

Sieve Size	Percent Passing
3/8-inch	100
No. 4	95-100
No. 16	45-80
No. 50	10-30
No. 100	2-10
No. 200	0-4

G. Topsoil Material: Refer to Specification Section 329200.

2.2 GEOTEXTILES

A. Drainage Geotextile: TenCate Mirifi 140N, or approved equal. Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications.

B. Separation Geotextile: TenCate Mirifi 600X, or approved equal. Woven geotextile fabric, manufactured for separation applications.

2.3 ACCESSORIES

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

PART 3 - EXECUTION

3.1 SITE 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 and maintain erosion and sedimentation controls during earthwork operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

D. The site shall be watered as required to moisture condition the native soils.

E. Notify Architect of unexpected subgrade conditions and discontinue affected work in area until notified to resume work.

F. Perform preparation for dewatering activities per ISPWC Section 205, if required.

3.2 EXCAVATION: GENERAL

A. Refer to Geotechnical Engineering Evolution for additional information.

B. All excavation depths noted in this section shall be from finish grade. Total excavation depths from existing ground elevation may be greater than depth listed. Coordinate with drawings for more information.

C. Identify required lines, levels, contours, and datum.

D. Protect above and below grade utilities which are to remain.

E. Grade top perimeter of excavation to prevent surface water from draining into excavation.

F. Following excavation to subgrade and prior to fill placement; subgrade surfaces shall be proof rolled in the presence of the geotechnical engineer. Correct Soft Subgrade Soil areas as

identified and directed by the Geotechnical Engineer. Proof rolling of subgrade soils shall be accomplished using a heavy rubber-tired, fully loaded, tandem-axle dump truck or equivalent.

G. Inspection & compaction testing shall be completed per the Division 01 Specifications.

H. Refer to ISPWC Section 205 for dewatering requirements.

3.3 EXCAVATION AND BACKFILL AT GEOTECHNICAL TEST PITS

A. Refer to geotechnical engineering evaluation for location and depth of test pits.

B. Excavate full depth of test pit until undisturbed, native subgrade is encountered.

C. Place Granular Structural Fill to total depth necessary to bring test pit to proposed subgrade elevation. Place in maximum 12-inch lose lifts and compact to a minimum of 95% per ASTM D1557.

D. Surface of compacted structural fill shall be smooth, even surface. Remove ridges and fill depressions.

E. Coordinate placement and grade with Excavation for Structures, Building Slabs, Building Foundations, Concrete Flatwork & Pavements, this section. Inspection & compaction testing shall be completed per the Division 01 Specifications.

3.4 EXCAVATION FOR CONCRETE FLATWORK AND PAVEMENTS

A. Excavate to indicated lines, cross sections, elevations, and subgrades.

B. All excavation depths noted in this section shall be from proposed finish grade.

C. Existing topsoil and uncontrolled fill materials must be completely removed from below proposed pavement areas to expose proper bearing soils as determined by Geotechnical engineer. Lean clay shall be excavated and removed as required to achieve specified pavement sections. Extend excavation 5-FT beyond pavement edges on all sides. Remove excavated soil material and dispose of off Owner’s property.

D. The exposed subgrade shall be proof-rolled and approved by the Geotechnical Engineer.

E. Repair soft subgrade soil areas as identified and directed by the Geotechnical Engineer.

3.5 EXCAVATION FOR UTILITY TRENCHES

A. Comply with the requirements of the ISPWC and the Local Agency Having Jurisdiction Standard Specifications.

B. Excavate trenches to indicated gradients, lines, depths, and elevations. Utility cover shall be per Division 33 and the Drawings.

C. Excavate trenches to a minimum width of 24” plus pipe or conduit outside diameter. Provide uniform clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12-inches higher than top of pipe or conduit unless otherwise indicated.

D. Remove excavated soil material and dispose of off Owner’s property.

E. 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. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material, 4 inches deeper elsewhere, to allow for bedding course.

3.6 EXCAVATION FOR LANDSCAPE AREAS

A. Excavate to indicated lines, cross sections, elevations, and subgrades.

B. The exposed subgrade shall be visually inspected to confirm it is firm and unyielding.

C. Subgrade upper 6-inches shall be compacted to 90% of ASTM D698.

D. Repair soft subgrade soil areas as identified and directed by the Owner’s Representative.

E. Excavate existing material out of all identified landscape areas as required to import and place new imported topsoil. All lawn areas shall receive a minimum depth of 12 inches and all planter beds shall receive a minimum depth of 18 inches. Coordinate with drawings and specification sections 329200 and 329300.

F. Remove all excavated soil material and dispose of off Owner’s property.

3.7 SUBGRADE INSPECTION

A. Notify Construction Manager when excavations have reached required subgrade elevations.

B. Prior to placement of subbase course and base course material at building and paved areas, the exposed subsoil surface should be proof-rolled under the observation of the Geotechnical Engineer.

C. Cut out soft or otherwise unsuitable areas of subgrade not capable of supporting structural loads. Backfill with Granular Structural Fill and compact to density equal to or greater than requirements for subsequent backfill material. Prior to placing Granular Structural Fill, the geotechnical engineer shall evaluate the over-excavated subgrade to determine if a Geotextile should be placed on the over-excavated subgrade.

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

3.8 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Protect as necessary to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations.
2. Coordinate stockpile requirements with the requirements of the Agency Having Jurisdiction and acceptable BMP's.

3.9 BACKFILL - GENERAL

A. Upon approved preparation and compaction of subgrade, placement of Subbase Course and Base Course Fill shall proceed.

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

C. Surface of Backfill shall be smooth, even surface. Remove ridges and fill depressions as required to meet finish grades.

D. Coordinate placement with Specification Section 033000 and Civil, Architectural and Structural Drawings.

E. Refer to ISPWC Section 205 for dewatering requirements.

3.10 GRANULAR STRUCTURAL FILL - GENERAL

A. Soils for use as Granular Structural Fill shall be as defined by this section.

B. The use of lean clay soils, silty soils, and uncontrolled fill materials as structural fill below building foundations, concrete flatwork, pavements, and building floor slabs is prohibited. Refer to geotechnical evaluation for more information.

C. Fill materials should be placed in layers not to exceed 12-inches in loose thickness.

D. Granular Structural Fill material should be moisture-conditioned to achieve optimum moisture content prior to compaction.

E. Each layer of fill should be compacted to the following density:

1. Below Structures and Rigid Pavements: A minimum of 95% of maximum dry density, as determined by ASTM D 1557.
2. Below Flexible Pavements: A minimum of 92% of ASTM D1557 or 95% of ASTM D698.

3.11 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. 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.

C. Backfill utility trenches using Bedding Course or Granular Structural Fill, compacted as specified below. Sufficient backfill should be placed over the utility before compacting with heavy equipment to prevent damage.

D. Subbase Course Fill should be placed and compacted to density equal to or greater than requirements for subsequent backfill material.

E. Place Subbase Course Fill at the following maximum loose depths prior to compaction:

1. Bedding Course: 6-Inch lifts prior to compaction
2. Granular Structural Fill: 12-Inch lifts prior to compaction.

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

G. Install warning tape directly above utilities, 12-inches below finished grade, except 6-inches below subgrade under pavements and slabs.

3.12 SUBBASE COURSE FILL

A. Upon approved preparation and observed proof-rolling of subgrade, placement of Subbase Course Fill shall proceed.

B. Place Subbase Course Fill as required to achieve correct subgrade elevation for placement of Base Course fill and indicated surface improvements. Place Subbase Course fill in maximum 12-inch lose lifts and compact as noted below.

C. Surface of Subbase Course Fill shall be smooth, even surface. Remove ridges and fill depressions as required to meet finish grades.

D. Coordinate with Specification Section 033000 and Architectural and Structural Drawings for placement for Building Foundations and Building Floor Slab.

E. Coordinate with Specification Section 321216 and Civil Drawings for placement for Asphalt Paving.

F. Each layer of Base Course fill should be compacted to the following density:

1. Below Building Foundations, Building Floor Slab, Structures and Rigid Pavements: A minimum of 95% of maximum dry density, as determined by ASTM D 1557.
2. Below Flexible Pavements: A minimum of 95% of the maximum dry density as determined by ASTM D 698.
3. Below Permeable Pavers: A minimum of 92% of maximum dry density as determined by ASTM D 1557.

3.13 BASE COURSE FILL

A. Upon approved placement and compaction of Subbase Course Fill, placement of Base Course Fill shall proceed.

B. Place and compact Base Course material in layers to required elevations. Place in maximum 6-inch lose lifts.

C. Place Base Course materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

D. Surface of Base Course shall be smooth, even surface. Remove ridges and fill depressions as required to meet finish grades.

E. Base Course Fill at Structures:

1. Structures: Compacted depth as shown on the Drawings.
2. Coordinate with Specification Section 033000 and Architectural and Structural Drawings.

F. Base Course at Pavement, Curbs, and Walks:

1. Light Duty Asphalt Paving: Place a 4-inch layer of compacted Base Course.
2. Concrete Flatwork, Curbs & Walks: Compacted depth as indicated on the drawings.

G. Place Base Course in maximum 6-inch thick loose lifts to bottom of structure, building slab, pavement, curb or walk. Base Course shall be moisture conditioned to within 2 percent of the optimum moisture.

H. Each layer of Base Course fill should be compacted to the following density:

1. Below Structures and Rigid Pavements: A minimum of 95% of maximum dry density, as determined by ASTM D 1557.
2. Below Flexible Pavements: A minimum of 95% of the maximum dry density as determined by ASTM D 698.

3.14 DRAINAGE COURSE AND BEDDING COURSE FILL

A. Drainage Course and Bedding Course shall be compacted, firm and unyielding. Proof roll in the presence of the geotechnical engineer.

B. Contractor shall add sand fines to bedding course fill as necessary to ensure surface of bedding course is firm and unyielding.

C. As-Built Topographic Survey – Contractor shall provide survey to confirm tolerance is met. Coordinate with this specification section.

3.15 LANDSCAPE FILL

A. Coordinate placement of topsoil with Specification Sections 329200.

3.16 GRADING

A. General: Uniformly grade areas to a smooth surface, free of 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 Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Site drainage should be directed away from structural areas, to avoid ponding of waters during storm events.

D. Grading inside Building Lines: Finish subgrade to a tolerance of 1/4 inch when tested with a 10-foot straightedge.

3.17 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Division 1.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. 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.

D. 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.

E. Testing agency will perform compaction testing at the following locations and frequencies:

1. Pavement, Walks, Pavers, and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 5,000 SF (Building Slab) and every 10,000 SF (paved areas) but in no case fewer than three tests at any pavement or slab type.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length, but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer (maximum 8” lifts), at least one test for every 100 feet or less of trench length, but no fewer than two tests.
4. Landscape Fill: at each compacted fill and backfill layer, at least one test for every 20,000 SF but in no case fewer than two tests.

5. Geotechnical Test Pits: one test at each compacted fill layer at each test pit.

F. 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 materials to depth required; re-compact and retest until specified compaction is obtained.

G. Refer to ISPWC Section 205 for dewatering requirements.

3.18 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 re-compact.

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 greatest extent possible.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

B. Refer to ISPWC Section 205 for dewatering requirements.

END OF SECTION 312000

SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hot-mix asphalt patching
2. Hot-mix asphalt paving
3. Pavement-marking paint

B. Related Sections:

1. Division 31 Section "Earth Moving" for aggregate subbase and base courses and for aggregate pavement shoulders.
2. Division 07 Section "Joint Sealants" for joint sealants and fillers at paving terminations.
3. The Asphalt Institute - Manual MS-4 - The Asphalt Handbook.
4. The Asphalt Institute - Manual MS-13 - Asphalt Surface Treatments for Asphalt Penetration Macadam.
5. Idaho Standards for Public Works Construction, Current Edition.
6. Geotechnical Engineering Evaluation as prepared by Atlas Technical Consultants.

1.2 DEFINITION

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

1.3 SUBMITTALS

A. Submit under provisions of Division 01 Specifications.

B. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

C. Submit design mix under provisions of Division 01.

D. Sieve analysis for all course and fine aggregate materials.

E. Submit pavement marking product data under provisions of Division 01.

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

G. Material Test Reports: For each paving material.

H. Operations & Maintenance Data: Submit Materials Testing reports for compaction testing of all asphalt paving.

1.4 QUALITY ASSURANCE

A. Perform work in accordance with the Current Edition of the Idaho Standards for Public Works Construction.

B. Mixing Plant: Conform to the Current Edition of the Idaho Standards for Public Works Construction and comply with ASTM D 3515.

C. Obtain materials from same source throughout duration of project.

1.5 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.

1.6 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. Tack Coat: Minimum surface temperature of 60 deg F.
2. Asphalt Single Course: Minimum surface temperature of 40 deg F and rising 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.

1.7 WARRANTY

A. Contractor shall warrant work as provided by the General and Supplementary Conditions and Division 01 Specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Asphaltic Concrete: Asphalt mix design shall meet the requirements of the ISPWC, Section 810 for Class III Plant Mix. RAP shall not exceed 15%.

B. Base Course (crushed aggregate base): Refer to Specification Section 312000.

C. Subbase Course (granular structural fill): Refer to Specification Section 312000.

D. Asphalt-Aggregate Mixtures: 1/2-inch mix design according to ISPWC Section 803.

2.2 ASPHALT MATERIALS

A. Asphalt Cement and Bituminous Materials per ISPWC Section 805.

B. The Contractor shall provide the Engineer with a Mix Design for approval prior to placement of Bituminous Paving Materials.

C. Plantmix Bituminous Pavement shall be Type 3, unless otherwise specified or approved.

D. Asphalt Tack Coat: per ISPWC Section 806.

E. Asphalt Prime Coat: per ISPWC Section 807.

F. Water: Potable.

G. Comply with requirements of AHJ for all asphalt work in the Right-of-Way.

2.3 AUXILIARY MATERIALS

A. Sand: AASHTO M 29, Grade Nos. 2 or 3.

B. Joint Sealant: AASHTO M 324, Type II of III.

C. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248; colors complying with FS TT-P-1952.

1. Color: Per the plans.

D. Glass Beads: AASHTO M 247, Type 1. Roadway pavement markings only.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that Base Course below proposed pavement areas is dry and in suitable condition to begin paving.

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

C. Verify that utilities, 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.

3.2 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. Re-compact existing unbound-aggregate base course to form new subgrade.

B. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.10 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.

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

3.3 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.

3.4 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared crushed surfacing below proposed pavement areas is ready to receive paving.

B. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.10 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.

C. Surface Course: The surface course lift shall be placed as near project substantial completion as possible.

1. Base course pavement shall be cleaned to remove all debris and dust.

2. Visually inspect base course pavement for mechanical or chemical damage. All areas with chemical damage, i.e. dripped fuels, or mechanical damage shall be identified and marked with paint for review by the Architect. All areas determined to require patching shall be patched per 3.2 of this Section prior to placement of surface course.
3. Apply tack coat to base course prior to placement of surface course at a rate of 0.15 gal/sq. yd.

3.5 HOT-MIX ASPHALT PLACING

A. 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. Light Duty Asphalt: Place hot-mix asphalt in single lift to 2.5-Inch compacted thickness.
2. Moderate Duty Asphalt: Place hot-mix asphalt in single lift to 2.5-Inch compacted thickness.
3. Spread mix at minimum temperature as required by binder temperature/viscosity curve.
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. 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.

C. 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.

3.6 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 cold 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.
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.

3.7 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. Compaction: 91% - 96% with a minimum average of 92%. Joint density should be at least 90 percent of Rice density.

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. 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.

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

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

3.8 INSTALLATION TOLERANCES - General

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Surface Course Asphalt Lift: Plus 1/4-inch, no minus.

B. Pavement Surface Smoothness: Comply with ISPWC Section 810. 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. Base Course Asphalt Lift: 1/4 inch.
2. Revise subparagraph above or first subparagraph below to suit Project.
3. Surface Course Asphalt Lift: 1/8 inch.
4. Retain subparagraph below if crowned pavement surfaces are required.

5. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.9 INSTALLATION TOLERANCES –RUNNING TRACK

A. Comply with INSTALLATION TOLERANCES – GENERAL for all items not specifically noted below.

B. Overall Grade and Planarity – the asphalt surface must be constructed at the designed elevation and slope. The finished surface shall not vary more than +/- 3/8" from designed elevation and grade.

C. Surface Smoothness – In order to drain properly and to be acceptable for competition, the surface must be smooth and regular, lacking depressions and ridges. The surface shall not vary more than 1/8" in 10' when measured in any direction using a straightedge. Contractor shall coordinate with Owner's Representative to demonstrate compliance.

1. Contractor shall flood entire track surface; any bird baths present after 20 minute shall be immediately corrected.

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

E. As-Built Topographic Survey – Contractor shall coordinate with Owner's Representative for as built survey to confirm tolerance is met.

1. Running Track and Jumping Event Space:
   a. Survey concrete curbs and base course surface prior to asphalt paving.
   b. Survey asphalt paving surface prior to track surfacing. Ground shots shall be at 15' O.C..

2. Create PDF showing constructed elevations. Identify all locations where tolerances exceed allowable deviations from design. Provide survey data in CAD format, if requested.

3.10 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Apply per ISPWC Section 1104.

C. Protect newly applied pavement-marking paint until it has fully cured.

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Field inspection and testing will be performed under provisions of Division 1.

C. Take samples and perform tests in accordance with The Asphalt Institute.

D. Frequency of Tests: Density Tests: 1 per 2000 sq. ft.

E. All paved surfaces shall be flooded with water in the presence of the Engineer to verify that all surfaces completely drain and no low depressed areas exist. A minimum of 48 hours notice shall be given.

F. Excessive rock pockets and/or cold joints (surface irregularities) are not acceptable and shall be corrected in a manner acceptable to the Engineer at no cost to the Owner.

G. Replace and compact hot-mix asphalt where core tests were taken.

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

3.12 PROTECTION

A. Immediately after placement, protect pavement from mechanical and chemical damage until date of Substantial Completion.

3.13 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 321216

SECTION 321313 - CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Site flatwork and curbs.
2. Bases for furnishings.
3. Reinforcing.
4. Joint Filler and Joint Sealant
5. Miscellaneous items shown.

1.2 RELATED SECTIONS

A. Division 31 Earth Moving

B. Idaho Standards for Public Works Construction, Current Edition.

C. Geotechnical Engineering Evaluation as prepared by Atlas Technical Consultants.

1.3 SUBMITTALS

A. Submit under provisions of Division 01 Specifications.

B. Product Data: For each type of product indicated.

C. Sieve analysis for all course and fine aggregate materials.

D. Shop Drawings: Indicate reinforcing steel sizes, spacing, locations and quantities for reinforcing steel, bending and cutting schedules, splicing, and supporting and spacing devices.

E. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments. Concrete testing data shall have been completed within 12 months of the submittal date.

F. Qualification Data: Ready-mix concrete manufacturer and testing agency.

G. Operations & Maintenance Data: Submit Materials Testing reports for sample and strength testing of all site concrete work.

1.4 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

B. ACI Publications: Comply with ACI 301 and ACI 316 unless otherwise indicated.

1.5 WARRANTY

A. Contractor shall warrant work as provided by the General and Supplementary Conditions and Division 01 Specifications.

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Recycled Content: Provide steel reinforcement with an average recycled content of steel so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, flat sheet.

C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

D. Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M or ASTM A 934/A 934M; with ASTM A 615/A 615M, Grade 60 deformed bars.

E. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 plain-steel bars; zinc coated (galvanized) after fabrication according to ASTM A 767/A 767M, Class I coating. Cut bars true to length with ends square and free of burrs.

F. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.

G. Hook Bolts: ASTM A 307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

H. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

I. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.

J. Zinc Repair Material: ASTM A 780.

2.3 CONCRETE MATERIALS

A. Cementatious Material: Provide in accordance with ISPWC Division 700. Portland Cement Type I or II.

B. Normal-Weight Aggregates: ASTM C 33, uniformly graded. Provide aggregates from a single source. Refer to ISPWC Section 703 for aggregate requirements.

1. Maximum Coarse-Aggregate Size 3/4 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
3. Use 1/2 inch maximum sized aggregate and high range water reducer in concrete at all round columns and exposed concrete wall to reduce bug holes and surface imperfections. Sack finishing will not be acceptable to cure surface problems.

C. Water: Potable and complying with ASTM C 94/C 94M.

D. Air-Entraining Admixture: ASTM C 260.

E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.4 CURING MATERIALS

A. Curing Compound: ASTM C 309, Type 1, Class A, water based.

B. Pre-Approved Product: W.R. Meadows 1100-Clear.

2.5 JOINT MATERIALS

A. Joint Fillers:

1. 1/2 thick Fiber Joint Filler as manufactured by W.R. Meadows, or approved equal. Provide resilient and non-extruding type pre-molded bituminous-impregnated fiberboard complying with ASTM D1751.
2. Use with Snap-Cap as manufactured by W.R. Meadows, or approved equal where joint is to be sealed. Coordinate with Drawings for location.

B. Joint Sealant: provide at locations shown on drawings only.

1. Tremco THC-901 – High Performance Multi-Component Polyurethane Sealant, or approved equal. Sealant shall meet or exceed the following specifications:

   a. U.S. Federal Specification TT-S-00227E, Class A, Type I
   b. ASTM C 920, Type M, Grade P, Class 25, Use T, M, & O

2. Tremco Universal Color Pak or pre-tinted in limestone. Color to match surrounding concrete flatwork.

2.6 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that meet or exceed requirements.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): 4000 psi.
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
3. Slump Limit: 3 inches, plus or minus 1 inch.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content: 6 percent plus or minus 1.5 percent for 3/4-inch nominal maximum aggregate size.

D. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture in concrete as required for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

E. Cementitious Materials: Limit percentage by weight of cementitious materials other than portland cement according to ACI 301 requirements as follows:

1. Fly Ash or Pozzolan: 25 percent.
2. Ground Granulated Blast-Furnace Slag: 50 percent.
3. Combined Fly Ash or Pozzolan, and Ground Granulated Blast-Furnace Slag: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed base course surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared base course surface below concrete flatwork, curb and paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll base course. Limit vehicle speed to 3 mph.
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Correct soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Division 31 Section "Earth Moving."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted base course surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Refer to drawings for location of reinforcement at all utility structures.

C. Coordinate with drawings for reinforcement at building doorways.

D. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

E. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

F. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

G. Zinc-Coated Reinforcement: Use galvanized-steel wire ties to fasten zinc-coated reinforcement. Repair cut and damaged zinc coatings with zinc repair material.

H. Epoxy-Coated Reinforcement: Use epoxy-coated steel wire ties to fasten epoxy-coated reinforcement. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Provide tie bars at sides of paving strips where indicated.

3. Butt Joints: Use epoxy bonding adhesive at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
4. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
5. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, columns, other fixed objects, new concrete flatwork to old concrete flatwork, and where indicated.

1. Extend joint fillers full width and depth of joint. No plug or sliver of concrete should extend over, under, through, around, or between sections of the filler board.
2. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated. Utilize filler board cap at all sealed joints.
3. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
4. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
5. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
6. Place joint sealant per Manufacturer's written specifications.

    a. Surfaces must be sound, clean and dry. Apply to surface when temperatures are 40 deg. F or above.
    b. Mix in accordance with written instructions on product packaging.
    c. Ensure joint filler is installed properly.
    d. Excess sealant and smears adjacent to the joint shall be carefully removed in accordance with written instructions.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-third of the concrete thickness, as follows:

1. Grooved Joints: Saw joints at locations shown.
2. Contraction Joints shall be constructed at the optimum time to prevent raveling (too early) and cracking (too late). Excessive raveling and chipping of joint edge will be cause for slab replacement.
3. Jointed panels should be as close to square as possible.
4. Contraction joints should be straight and continuous. Align joints of adjacent panels.
5. Align joints in attached curbs with joints in pavement.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/2-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Place reinforcing bars at locations shown on drawings.

E. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

F. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

G. Deposit and spread concrete in a continuous operation between transverse joints.

H. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

I. Screed paving surface with a straightedge and strike off.

J. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

K. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

L. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

M. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

N. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

a. Water.
b. Continuous water-fog spray.
c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 1/4 inch flatwork
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-foot- long, unleveled straightedge not to exceed 1/2 inch.
4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches of tie bar.
5. Lateral Alignment and Spacing of Dowels: 1 inch.
6. Vertical Alignment of Dowels: 1/4 inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
8. Joint Spacing: 3 inches.
9. Contraction Joint Depth: Plus 1/4 inch, no minus.
10. Joint Width: Plus 1/8 inch, no minus.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.

a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

    a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 5000 psi.

D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

G. Concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections. Pressure washing or other method shall be used to remove stains and tire markings if necessary.

E. All concrete paving shall be broom clean at date of Substantial Completion.

END OF SECTION 321313

SECTION 321823

SYNTHETIC RUNNING TRACK SURFACING

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Resilient athletic surface for athletic track and field events.
   2. Track Markings
B. The synthetic track surfacing shall be placed on asphalt at locations indicated on the plans.

1.2 DESCRIPTION OF WORK

A. The contracted work to be done under these specifications consists of furnishing all the required labor, materials, equipment, parts and supplies necessary for the installation of the running track surface.
B. The work hereunder shall be done and conform to the standards for track construction as prescribed by the NFHS Rule Book and the NFHS Court and Field Diagram Guide, Current Edition.

1.3 SUBMITTALS

A. Submit under provisions of Division 1.
B. Product Data: Provide component data to demonstrate compliance with specifications and Material Safety Data Sheet.
C. Submit complete installation specification, and items regarded as technical guidelines for installation of the surface that vary from the specification.
D. Three 6” x 6” samples of finished product.
E. MSDS Sheets for all materials to be used.
F. Sample Warranty.
G. Striping information sheets.
H. Colored render of the track primary and secondary color locations
I. Operation and Maintenance Data
   1. Submit under provisions of Division 1.
   2. Maintenance Data: Include cleaning procedure and any owner material maintenance requirements.

1.4 QUALITY ASSURANCE

A. Qualifications
   1. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five (5) years documented experience.
   2. No subcontractors are permitted in the installation of the synthetic surface.
B. The Surfacing Contractor bidding this project is not permitted to sub-contract any portion of this Section.
C. The synthetic track surface shall be installed by authorized applicators of the approved manufacturer acceptable to the Owner’s Representative. The Owner’s Representative reserves the right of final acceptance of any crew member of the Contractor.
D. Owner reserves the right to award the contract to the bidder it concludes to be in its best

interest. The owner will perform its own research, and the owner's decision shall be final.

E. Any all-weather surfacing contractor wishing to bid this project, who is in default of warranty work as judged by previous clients, will not be allowed to bid the project or its bid will not be considered.

F. Coordinate with Section 321216 and 321313 for asphalt and concrete installation tolerances prior to installation of track surfacing.

1.5 DELIVERY, STORAGE AND HANDLING

A. Make no deliveries to the project until ready to install or until approved storage is provided. Where this provision is neglected, and material is delivered to the project site when the latter is not available to receive it, such materials shall be properly stored elsewhere at the Contractor's expense with adequate insurance coverage provided for the of-site storage.

B. Deliver materials in manufacturer's original, unopened containers and rolls with labels intact and legible.

C. Store materials on clean, raised platforms with weather tight protective covering when stored outdoors. Secure coverings against wind.

D. Handle all materials in a manner which will not damage material. Store rolled goods on end.

E. Select and operate material handling equipment and store materials to prevent damage to existing or new construction.

F. Damage to existing construction shall be immediately reported to the Contractor and Architect.

1.6 PROJECT/SITE CONDITIONS

A. Surfacing application shall be performed only in dry conditions with minimal wind. Pavement temperature must be at least 50^{o} F. and rising.

B. If Surfacing Contractor and Architect mutually agree that weather conditions are detrimental to proper installation, work will be delayed until weather condition are acceptable.

C. Provide temporary barriers as required to prevent public entry to construction area and to protect adjacent properties from damage during construction operation.

D. Confirm asphalt surface is in compliance with specifications section 321216 and 321313 prior to installation of track surface.

1.7 WARRANTY

A. Contractor shall warrant work as provided by the General and Supplementary Conditions and Division 01 Specifications.

1.8 EXTENDED WARRANTY

A. Prior to acceptance of the Work, furnish resilient surfacing manufacturer's written five (5) year warranty for surfacing, against all defects in materials and workmanship, including such defects as bubbling, blistering, fading, delamination, peeling, loss of integrity and excessive wear.

B. The warranty shall cover defects in materials, excessive color change, excessive wear and any other feature which is not deemed ordinary wear on a running track.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Beynon L2000 – 503.691.2484 or www.beynonsports.com.
B. Plexitrac Lightning – 208.871.5922 or www.plexipave.com/track.
C. Substitutions or equivalent products shall be in accordance with Division 01 Specifications.

2.2 MATERIALS

A. Latex based surfacing, in compliance with the following (use as design basis).
   1. SBR/Polyurethane with latex binder.
   2. Installed Using Specifically Designed Sports Paving and Mixing Machines.
B. Colors:
   1. Black, submit to Architect for approval.
C. All materials shall be per manufacturer's standard specifications. Submit for approval prior to installation.
D. Track Markings line paint shall be 100% polyurethane, manufactured especially for painting lines on tracks. Traffic paints, latex, or oil base paints are not permitted. Use paint recommended by the manufacturer of the track surface.

PART 3 – EXECUTION

3.1 INSTALLATION GENERAL

A. Do not proceed with surface installation until as-built topographic survey of asphalt surface is completed and approved. Coordinate with section 321216 and 321313.

3.2 SURFACE PREPARATION

A. Bituminous surface: Prior to start of installation; verify asphalt concrete paving for dimensional accuracy, strength, surface preparation and planarity. Notify Owners Representative of any deficiencies.
B. Clean surfaces to receive all-weather surfacing by sweeping, power blowing, or pressure washing to remove dust and debris to provide a condition that meets all-weather surfacing manufacturer's recommendations.
C. Repair bituminous pavement surface elevation or deformation with surfacing manufacturer's recommended composite filler material.
D. Beginning installation stipulates track installer "accepts" existing conditions. Adhesion to the existing asphalt is the Contractor's responsibility.

3.3 SURFACE LIMITATIONS

A. Asphalt base cure time is 14-21 days before application of the synthetic surface.
B. Apply the synthetic surfacing materials only during favorable weather conditions. Work is to progress only when the installer can guarantee adequate curing.
C. No application of the surfacing shall be conducted during rainfall, when rain is imminent, when freezing temperatures are forecasted or exist, or when gusting winds are occurring.
D. During surface installation and striping, all sprinkler systems must be shut off, or controlled so that no water falls on the track or event surfaces.
E. All materials will be installed in strict compliance with the manufacturer's recommendations.
F. Thorough drying between each layer is required before successive coats of rubber are

applied. “Batching” of the binder and rubber, or “wet spraying” binder and rubber, or other methods used to reduce the number of layers applied are not allowed.

G. Materials shall be applied in even layers with equipment specifically designed for the installation of resilient surfacing. Allow each layer to cure before a succeeding layer is applied.

3.4 SURFACE EXECUTION

A. Per manufacturer’s specifications. Submit written installation procedures for approval.

3.5 PAINT MARKING APPLICATION

A. Layout:
   1. Lines and markings shall be made by a competent and experienced track marking specialist.
   2. Locate and confirm radius points.
   3. Establish and set all necessary control points.
   4. Measurements shall be made on the track to the nearest 1/100th of a foot.
   5. Angles shall be set by using a transit or theodilite capable of reading direct to 20 seconds. The markings on the curve may also be set using the chord length method.
   6. Measurements shall be made with a steel tape in engineering scale.
   7. Markings shall be clearly identified and color coded.

B. Symbols:
   1. All lanes and lines shall be white 2 inch wide markings.
   2. All starts and finishes shall be 2 inch wide lines.
   3. Exchange zones shall be indicated with triangles with a 41 inch base and 24 inches high, with the base as limit of the zone.
   4. Acceleration marks shall be 2 inch wide by 4 inch long dash marked clearly in the center of the lane.
   5. Hurdle marks shall be 2 by 2 inch tic marks on the lane line on both sides of the lane.
   6. Lane numbers shall be not less than 42 inches high and located as directed by the Architect in four locations. Numbers shall be in two colors (shadowed background as selected by the Architect).
   7. Event identification shall be 4 inch letters stenciled below and to the right of each lane and mark.
   8. Scratch lines for the jumping events shall be 8 inches wide.
   9. All starts and finishes shall be clearly marked with the start of said events.
   10. All symbols shall have the proper color code for the event.

C. Painting:
   1. No thinners shall be used.
   2. No painting shall be performed with the velocity of the wind exceeds 12 mph, unless the spray equipment is equipped with the proper air curtains.
   3. Allow at least 48 hours for sheen coat or seal coat to cure before marking.
   4. Markings shall receive two coats of paint to achieve the full opaque results.
   5. Applications of paint shall be directly from original containers according to manufacturer's recommendations.
   6. Protect the newly painted areas from traffic until the paint has thoroughly dried.

3.6 FIELD QUALITY CONTROL

A. Comply with manufacturer's written specifications. Submit for approval.

3.7 CLEANING

A. Upon completion of the work, the contractor shall remove all containers, surplus materials and debris and have the site in a clean and orderly condition acceptable to the Owner's Representative.

END OF SECTION 321823

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SECTION 321824 - SYNTHETIC RUNNING TRACK SURFACING

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Resilient athletic surface for athletic track and field events.
   2. Track Markings
B. The synthetic track surfacing shall be placed on asphalt at locations indicated on the plans.

1.2 DESCRIPTION OF WORK

A. The contracted work to be done under these specifications consists of furnishing all the required labor, materials, equipment, parts and supplies necessary for the installation of the running track surface.
B. The work hereunder shall be done and conform to the standards for track construction as prescribed by the NFHS Rule Book and the NFHS Court and Field Diagram Guide, Current Edition.

1.3 SUBMITTALS

A. Submit under provisions of Division 1.
B. Product Data: Provide component data to demonstrate compliance with specifications and Material Safety Data Sheet.
C. Submit complete installation specification, and items regarded as technical guidelines for installation of the surface that vary from the specification.
D. Three 6” x 6” samples of finished product.
E. MSDS Sheets for all materials to be used.
F. Sample Warranty.
G. Striping information sheets.
H. Colored render of the track primary and secondary color locations
I. Operation and Maintenance Data
   1. Submit under provisions of Division 1.
   2. Maintenance Data: Include cleaning procedure and any owner material maintenance requirements.

1.4 QUALITY ASSURANCE

A. Qualifications
   1. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five (5) years documented experience.
   2. No subcontractors are permitted in the installation of the synthetic surface.
B. The Surfacing Contractor bidding this project is not permitted to sub-contract any portion of this Section.
C. The synthetic track surface shall be installed by authorized applicators of the approved manufacturer acceptable to the Owner’s Representative. The Owner’s Representative reserves the right of final acceptance of any crew member of the Contractor.
D. Owner reserves the right to award the contract to the bidder it concludes to be in its best interest. The owner will perform its own research, and the owner’s decision shall be final.

E. Any all-weather surfacing contractor wishing to bid this project, who is in default of warranty work as judged by previous clients, will not be allowed to bid the project or its bid will not be considered.
F. Coordinate with Section 321216 and 321313 for asphalt and concrete installation tolerances prior to installation of track surfacing.

1.5 DELIVERY, STORAGE AND HANDLING

A. Make no deliveries to the project until ready to install or until approved storage is provided. Where this provision is neglected, and material is delivered to the project site when the latter is not available to receive it, such materials shall be properly stored elsewhere at the Contractor's expense with adequate insurance coverage provided for the of-site storage.
B. Deliver materials in manufacturer's original, unopened containers and rolls with labels intact and legible.
C. Store materials on clean, raised platforms with weather tight protective covering when stored outdoors. Secure coverings against wind.
D. Handle all materials in a manner which will not damage material. Store rolled goods on end.
E. Select and operate material handling equipment and store materials to prevent damage to existing or new construction.
F. Damage to existing construction shall be immediately reported to the Contractor and Architect.

1.6 PROJECT/SITE CONDITIONS

A. Surfacing application shall be performed only in dry conditions with minimal wind. Pavement temperature must be at least 50^{o} F. and rising.
B. If Surfacing Contractor and Architect mutually agree that weather conditions are detrimental to proper installation, work will be delayed until weather condition are acceptable.
C. Provide temporary barriers as required to prevent public entry to construction area and to protect adjacent properties from damage during construction operation.
D. Confirm asphalt and concrete surfaces is in compliance with specifications section 321216 and 321313 prior to installation of track surface.

1.7 WARRANTY

A. Contractor shall warrant work as provided by the General and Supplementary Conditions and Division 01 Specifications.

1.8 EXTENDED WARRANTY

A. Prior to acceptance of the Work, furnish resilient surfacing manufacturer's written five (5) year warranty for surfacing, against all defects in materials and workmanship, including such defects as bubbling, blistering, fading, delamination, peeling, loss of integrity and excessive wear.
B. The warranty shall cover defects in materials, excessive color change, excessive wear and any other feature which is not deemed ordinary wear on a running track.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Beynon BSS 200 – 503.691.2484 or www.beynonsports.com.
B. Hellas eqiQTracks V300 – 425.248.8779 or www.epictracks.com.
C. Substitutions or equivalent products shall be in accordance with Division 01 Specifications.

2.2 MATERIALS

A. Sealed base mat, structural spray; In compliance with the following (use as design basis).
   1. Paved-in-Place SBR base mat with polyurethane binder. Sealed and coated with structural spray.
   2. Installed Using Specifically Designed Sports Paving and Mixing Machines.
B. Colors:
   1. Black, submit to Architect for approval.
C. All materials shall be per manufacturer's standard specifications. Submit for approval prior to installation.
D. Track Markings line paint shall be 100% polyurethane, manufactured especially for painting lines on tracks. Traffic paints, latex, or oil base paints are not permitted. Use paint recommended by the manufacturer of the track surface.

PART 3 – EXECUTION

3.1 INSTALLATION GENERAL

A. Do not proceed with surface installation until as-built topographic survey of asphalt and concrete surface is completed and approved. Coordinate with section 321216 and 321313.

3.2 SURFACE PREPARATION

A. Bituminous surface: Prior to start of installation; verify asphalt or concrete paving for dimensional accuracy, strength, surface preparation and planarity. Notify Owners Representative of any deficiencies.
B. Clean surfaces to receive all-weather surfacing by sweeping, power blowing, or pressure washing to remove dust and debris to provide a condition that meets all-weather surfacing manufacturer's recommendations.
C. Repair bituminous pavement surface elevation or deformation with surfacing manufacturer's recommended composite filler material.
D. Beginning installation stipulates track installer "accepts" existing conditions. Adhesion to the existing asphalt is the Contractor's responsibility.

3.3 SURFACE LIMITATIONS

A. Asphalt base cure time is 14-21 days before application of the synthetic surface.
B. Apply the synthetic surfacing materials only during favorable weather conditions. Work is to progress only when the installer can guarantee adequate curing.
C. No application of the surfacing shall be conducted during rainfall, when rain is imminent, when freezing temperatures are forecasted or exist, or when gusting winds are occurring.
D. During surface installation and striping, all sprinkler systems must be shut off, or controlled so that no water falls on the track or event surfaces.
E. All materials will be installed in strict compliance with the manufacturer's recommendations.
F. Thorough drying between each layer is required before successive coats of rubber are applied. "Batching" of the binder and rubber, or "wet spraying" binder and rubber, or other methods used to reduce the number of layers applied are not allowed.
G. Materials shall be applied in even layers with equipment specifically designed for the

installation of resilient surfacing. Allow each layer to cure before a succeeding layer is applied.

3.4 SURFACE EXECUTION

A. Per manufacturer’s specifications. Submit written installation procedures for approval.

3.5 PAINT MARKING APPLICATION

A. Layout:
1. Lines and markings shall be made by a competent and experienced track marking specialist.
2. Locate and confirm radius points.
3. Establish and set all necessary control points.
4. Measurements shall be made on the track to the nearest 1/100th of a foot.
5. Angles shall be set by using a transit or theodilite capable of reading direct to 20 seconds. The markings on the curve may also be set using the chord length method.
6. Measurements shall be made with a steel tape in engineering scale.
7. Markings shall be clearly identified and color coded.

B. Symbols:
1. All lanes and lines shall be white 2 inch wide markings.
2. All starts and finishes shall be 2 inch wide lines.
3. Exchange zones shall be indicated with triangles with a 41 inch base and 24 inches high, with the base as limit of the zone.
4. Acceleration marks shall be 2 inch wide by 4 inch long dash marked clearly in the center of the lane.
5. Hurdle marks shall be 2 by 2 inch tic marks on the lane line on both sides of the lane.
6. Lane numbers shall be not less than 42 inches high and located as directed by the Architect in four locations. Numbers shall be in two colors (shadowed background as selected by the Architect).
7. Event identification shall be 4 inch letters stenciled below and to the right of each lane and mark.
8. Scratch lines for the jumping events shall be 8 inches wide.
9. All starts and finishes shall be clearly marked with the start of said events.
10. All symbols shall have the proper color code for the event.

C. Painting:
1. No thinners shall be used.
2. No painting shall be performed with the velocity of the wind exceeds 12 mph, unless the spray equipment is equipped with the proper air curtains.
3. Allow at least 48 hours for sheen coat or seal coat to cure before marking.
4. Markings shall receive two coats of paint to achieve the full opaque results.
5. Applications of paint shall be directly from original containers according to manufacturer's recommendations.
6. Protect the newly painted areas from traffic until the paint has thoroughly dried.

3.6 FIELD QUALITY CONTROL

A. Comply with manufacturer’s written specifications. Submit for approval.

3.7 CLEANING

A. Upon completion of the work, the contractor shall remove all containers, surplus materials and debris and have the site in a clean and orderly condition acceptable to the Owner's Representative.

END OF SECTION 321824

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SECTION 328400 - PLANTING IRRIGATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Pipe and fittings, sprinkler heads, accessories, and connections to water source.

B. System Description

1. Repair and modification of existing system.
2. Manual underground irrigation system.

C. Related Sections

1. Division 01 Sections
2. Division 26 Sections for electrical power materials and installations.
3. Division 31 Sections for Earth Moving
4. Division 32 Sections for Turf and Grasses

1.2 DEFINITIONS

A. Pipe sizes used in this Section are nominal pipe size (NPS) in inches. Tube sizes are Standard size in inches.

B. Pressure Piping Main Line: Piping downstream from supply piping to and including control valves. Piping is under irrigation system pressure.

C. Circuit Piping Lateral Lines: Piping downstream from control valves to irrigation system sprinklers. Piping is under pressure (less than pressure piping) during flow.

D. Control Valve: Automatic (electrically operated) valve for control water flow to irrigation system zone.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. Location of Sprinklers and Devices: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions such as signs and light standards.

B. Minimum Water Coverage: Not less than:

1. Turf Areas: 100 percent.

C. All flow velocities, within the entire irrigation system, shall not exceed 5 feet per second.

1.4 SUBMITTALS

A. Product data including pressure rating, rated capacity, settings, and electrical data of all products to be used for this project including but not limited to all products listed in Part 2 of this specification and shown on the Drawings.

B. Irrigation system record drawings.

C. Irrigation system testing results when applicable, see Part 3 of this Section.

D. Operations & Maintenance Data: Submit manufacturer's written Operations & Maintenance data for all Irrigation System and Control components.

1.5 QUALITY ASSURANCE

A. Comply with requirements of utility supplying water for prevention of backflow and backsiphonage. Comply with appropriated water rights.

B. Installer Qualifications: Engage an experienced Installer with a minimum of five years experience and who has completed irrigation systems similar in material, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance.

C. Listing/Approval Stamp, Label, or Other Marking: On equipment, specialties, and accessories made to specified standards.

D. Listing and Labeling: Equipment, specialties, and accessories that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in "National Electrical Code," Article 100.
2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

E. Product Options: Irrigation system piping, specialties, and accessories are based on specific types, manufacturers, and models indicated. Components with equal performance characteristics produced by other manufacturers may be considered, provided deviations in dimensions, operation, and other characteristics do not change design concept or intended performance as judged by the Architect. The burden of proof of product equality is on the Contractor. Any substitutions must be approved by the Architect in writing prior to installation per Division 01 Specifications.

1.6 SEQUENCING AND SCHEDULING

A. Contractor shall schedule a pre-construction meeting with the landscape architect in coordination with sections 328200 and 329200.

B. Coordinate irrigation systems work with landscape work specified and in the Drawings.

1.7 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish extra materials matching products installed as described below. Package them with protective covering for storage and label clearly describing contents. Coordinate with drawings for specific quantities. The quantities below are for each type of product and apply to each school.

1. (1) Box – Rotor Sprinkler Bodies – Each Type
2. (1) Rotor Nozzle Tree, Each body – Each Type
3. (1) Box – Turf Spray Bodies – Each Type
4. (15) Spray nozzles – Size and type per drawing
5. (1) Valve Key, Each Type
6. (2) Decoder, Each Type (as required)

1.8 IRRIGATION RECORD DRAWINGS

A. Record accurately, on one set of black and white prints of the site plan, all installed work including both pressure and non-pressure lines and pipe sizes.

B. Upon completion of each increment of work, transfer all such information and dimensions to the print. The dimensions shall be recorded in a legible and workmanlike manner. Maintain as-built drawings on site at all times. Make all notes on drawing in pencil (no ball point pen). When the work has been completed, transfer all information from the field record print to a set of reproducible drawings.

C. Dimension from two permanent points of reference (buildings, monuments, sidewalks, curbs, pavements, etc.). Locations shown on as-built drawings shall be kept day to day as the project is being installed. All dimensions noted on drawings shall be 1/8 inch in size (minimum).

D. Show locations and depths of the following items:

1. Point of connection
2. Routing of sprinkler pressure lines
3. Gate valves
4. Sprinkler control valves
5. Quick coupling valves
6. Routing of control wires
7. Sprinkler heads
8. Other related equipment

1.9 WARRANTY

A. Contractor shall warrant work as provided by the General and Supplementary Conditions and Division 01 Specifications.

PART 2 - PRODUCTS

2.1 SUMMARY

A. Substitutions or equivalent products shall be in accordance with Division 01 Specifications.

2.2 PIPE AND ACCESSORIES

A. PVC Pipe & Fittings: Size and type as indicated on the drawings.

1. Pipe walls shall be uniform, smooth, glossy, and free of interior or exterior extrusion marks; pre-belled or straight to receive solvent-weld couplings; 20 foot standard lengths.
2. Pipe shall be marked with manufacturer's name, class of pipe, NSF seal, and date/shift of manufacturing run.
3. PVC Pipe: ASTM D1785, D2241
4. PVC Fittings: ASTM D2464, D2466
5. Solvent Cement: ASTM F 656 primer and ASTM D 2564 solvent cement.
6. Gasketed Pipe Fittings: Fittings shall be ductile iron, slanted, deep bell, gasket style made in accordance with ASTM A536, Grade 65-45-12 & AWWA C153. All gaskets shall be manufactured of high grade EPDM rubber. All fittings shall have epoxy coating as standard finish. Manufactured by Leemco, Inc., or approved equal.
7. Thrust Blocks: Refer to Drawings.
8. All galvanized steel pipe and fitting shall be tapped with corrosion protection tape by Pasco “All Weather” Pipe Protection Tape System or approved equal.

2.3 VALVES

A. General: Valves are for general-duty and underground applications. Size as noted on the drawings.

B. Quick Coupler Per drawings. Stabilization as shown on the drawings.

C. Isolation Valves: Brass, Full Port, Threaded Ends. Valve pressure rating to 200 PSI – Refer to Drawings.

2.4 SPRINKLERS

A. General: Manufacturer’s standard sprinklers designed to provide uniform coverage over entire area of spray shown on drawings. Size and type as noted on the drawings.

B. Rotor Sprinklers: Per drawings, Nozzle as noted on Drawings.

C. Turf & Bed Spray Sprinkler: Per drawings, Nozzle as noted on Drawings.

D. Swing Joints:

1. Rotor Sprinklers: as noted on drawings.

2. Spray Sprinkler: Hunter FlexSG tubing; 12” min./18” max. with Hunter Spiral Barb Fittings as required.

2.5 AUTOMATIC CONTROL SYSTEM

A. General: Low-voltage controller system, made for control of irrigation system automatic control valves. Controller operates on 120 volts a.c. building power system, provide 24 volts a.c. power to control valves, and includes stations for at least the number of control valves indicated. Coordinate with drawings for location.

B. Controller: Existing. Coordinate improvements with existing controller.

C. Surge Protection: as required per existing controller’s manufacturers recommendations. Install at all required grounding per manufacturers recommendations along two-wire path.

D. Control Wiring: Match existing.

2.6 VALVE BOXES AND COVERS

A. Remote Control Valve: Per drawings, green body with locking green lid. Provide lock down bolt at date of substantial completion.

B. Gate valves, Quick Coupler Valves & Misc.: Per drawings, green body with locking green lid.

2.7 IRRIGATION SYSTEM ACCESSORIES

A. None.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Investigate and determine available water supply water pressure and flow characteristics.

B. Examine areas and conditions where irrigation system is to be installed. Proceed with installation after unsatisfactory conditions have been corrected.

3.2 INSTALLATION GENERAL

A. Comply with manufacturer’s written installation instructions. Complete field assembly of components where required.

B. Install piping and control wires in sleeves where crossing under sidewalks, roadways, parking lots, playgrounds and other paved areas. Coordinate with other trades to install sleeving prior to paving operations.

C. Storage of Materials: Store all materials in a secure location. Do not allow materials to be exposed to environmental conditions that are harmful to the material, i.e. sun and windblown dust. Cover materials to protect when required.

3.3 PIPE AND ACCESSORIES

A. General: Drawings indicate general location and arrangement of piping system. Install piping as indicated, except where deviations to layout are required. Record all deviations on the Record Drawings.

1. Install piping free of sags and bends. Deflection angles shall not exceed manufacturer's recommendations.
2. Locate groups of pipes parallel to each other, spaced to permit valve servicing.
3. Install all required fittings for change in direction and connection to components.
4. Pipe Trench Size:

    a. Minimum Depth: as indicated on the Drawings.
    b. Minimum Width: 3 times pipe diameter.

B. PVC Pipe and Fittings: Install per manufacturer's written specifications.

1. Lay piping on solid subbase, uniformly sloped without humps or depressions.
2. Install piping during dry weather when temperature is above 40 deg F.
3. Solvent Weld Joints per manufacturer's written specifications. Allow joints to cure prior to testing.
4. Gasketed Pipe Fittings: Install per manufacturer's written specifications. Provide additional thrust blocking where required.
5. Thrust Blocking: as required
6. Pipe trenching shall be as indicated on the drawings.
7. Backfill trenches with soil free of large lumps, rocks or debris. Carefully place backfill around and over the pipe in layers not to exceed 6" depth. Water settle each lift of trench backfill.
8. Backfill trenches under areas to be paved per Division 31 and 33 Specification Sections.
9. Contractor shall correct any settling of trenches throughout the warranty period at no cost to the owner.
10. Install unions and valves per manufacturer's written specifications.

3.4 VALVES

A. Valves: Install underground valves in valve boxes as shown on Drawings.

B. Mainline Isolation Valves: Install with pipe extension to valve box for ease of operation as shown on the drawings. Comply with manufacturer's written installation instructions.

C. Quick Coupler Valves: Install in valve box per manufacturer's written instructions. Include stabilization as shown on the drawings.

D. Place 6-inches minimum of gravel below valves for drainage. Maintain 4-inches minimum between bottom of valves and top of gravel where applicable. Valve box shall be free of dirt and debris.

3.5 SPRINKLERS

A. General: Flush all mainline and lateral line piping with full head of water prior to installation of sprinklers.

B. Rotor Sprinklers, Turf Rotator Sprinklers & Spray Sprinklers: Install per manufacturer's written specifications.

1. Install lawn sprinklers at manufacturer's recommended heights in relation to ground surface.
2. Make all required connections to Swing Joints.
3. Adjust spray pattern to avoid paved areas and building walls.
4. Install required nozzles for 100% coverage and optimum performance.

3.6 VALVE BOXES AND COVERS

A. Install per manufacturer's written specifications and as shown on drawings.

B. Install paving brick at each corner of rectangular boxes and on two sides of round boxes.

C. Install valve box extensions as required. Set valve box lid flush to finish grade.

D. Provide 6-inch depth 3/8-inch gravel in bottom of each box.

E. Install valves aligned and equally spaced as shown on the drawings.

F. Provide and install lockdown bolt at date of substantial completion.

3.7 CONTROL SYSTEM

A. Install all required valve control communication and power wiring for a fully functional system.

B. Install control wiring in same trench with piping. Where wiring requires a trench separate from piping, install wiring in conduits. Provide wire connections per manufacturer's written specifications.

1. Control wiring shall be installed in straight runs per manufacturers recommendations. Looped runs are not allowed.

C. Should two wire system be encountered, install decoders as shown on drawings and per manufacturer's written instructions. Route control wire from decoder to valve through conduit as shown on drawings.

D. Install all exposed wiring in rigid conduit as shown on the drawings.

3.8 IRRIGATION SYSTEM ACCESSORIES

A. Standard yellow I.D. tags submit product for approval prior to ordering.

B. Locator Tape: 2-inch wide purple, marked “IRRIGATION”. At main line only.

3.9 EXISTING SYSTEM MODIFICATIONS

A. Investigate existing site conditions as needed to become familiar with the existing system.

3.10 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Division 01 Specifications.

B. Coordinate field inspection and testing with Specification Sections 329200.

C. Contractor Performed Testing: The contractor shall perform the following testing and provide written confirmation of completed and successful testing to the Architect.

1. Main Line Pressure Testing: Perform test of piping and valves before back-filling trenches. Piping may be tested in sections to expedite work.

    a. Make all necessary provisions for thoroughly bleeding the line of air and debris.
    b. Provide all required thrust blocking for testing while trenches remain open.
    c. Before testing, fill the line with water for a period of at least 24 hours.
    d. After valves have been installed, test all live water lines for leaks at a pressure of 100 psi for a period of two hours, with all couplings exposed and with all pipe sections center-loaded.
    e. Furnish all necessary testing equipment and personnel.
    f. Correct all leaks and retest until successful completion of test.
    g. Pressure loss of less than 3 psi in two hours is acceptable.
    h. Provide written certification of successful test to the architect listing the following data: date of test, time of test start, time of test completion, pressure loss during testing period, graphic depiction of main line tested, name and signature of contractor representative performing test.

D. Landscape Architect Performed Testing:

1. Installation Inspection: The Contractor shall schedule one site visit with the landscape architect to observe the following in-progress work.

    a. Observe installation of main line and lateral line piping systems.
    b. Observe installation of control valve assembly and valve box.

2. Sprinkler Coverage Testing: The Contractor shall schedule one site visit with the landscape architect to observe the following in-progress work.

    a. Run each zone for the time required to observe coverage of heads.
    b. Coverage test to be performed prior to installation of plant material seed or sod.
    c. Correct coverage issues indicated by landscape architect.

d. Adjust nozzle spray pattern as required to avoid water spray on building walls, roads or sidewalks.

3.11 CLEANING AND ADJUSTING

A. Flush dirt and debris from piping before installing sprinklers and other devices.

B. Adjust automatic control valves to provide flow rate of rated operating pressure required for each sprinkler circuit.

C. Carefully adjust lawn sprinklers so they will be flush with finish grade after completion of landscape work. Adjust so that sprinklers do not spray on walks, buildings or walls.

D. Adjust settings of controllers and automatic control valves to insure proper watering of all landscaping.

3.12 DEMONSTRATION

A. Provide irrigation system demonstration under provisions of Division 1. Record on DVD video format if requested by Owner.

B. Demonstrate to Owner: that system meets coverage requirements and that automatic control functions properly.

C. Demonstrate to Owner’s maintenance personnel operation of equipment, sprinklers, specialties, and accessories. Review operating and maintenance information including start up and winterization procedures.

END OF SECTION 328400

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SECTION 329200 - TURF AND GRASSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Topsoil placement
2. Soil Preparation, amendment and fertilization
3. Finish Grading
4. Turf Sodding
5. Sod establishment
6. Turf Maintenance
7. Clean-up

B. Definitions

1. Weeds: Include 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, Brome Grass, Black Henbane, Buffalobur, Common Crupina, Dalmatian Toadflax, Diffuse Knapweed, Dyer's Woad, Eurasian Watermilfoil, Field Bindweed, Hoary Cress, joined Goatgrass, Leafy Spurge, Matgrass, Meadow Hawkweed, Meadow Knapweed, Milium, Musk Thistle, Orange Hawkweed, Perennial Pepperweed, Perennial Sowthistle, Poison Hemlock, Puncturevine, Purple Loosestrife, Russian Knapweed, Scotch Broom, Scotch Thistle, Silverleaf Nightshade, Skeletonleaf Bursage, Spotted Knapweed, Syrian Beancaper, Toothed Spurge, Yellow Starthistle, Yellow Toadflax.
2. Finish Grade: Elevation of finished surface of planting soil.
3. Planting Soil: Imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.
4. Topsoil: material per specifications section 312000.
5. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

C. Related Sections include the following:

1. Specification Section 311000 Site Clearing.
2. Specification Section 312000 Earth Moving.
3. Specification Section 328400 Planting Irrigation.
4. Division 01 Specifications.

1.2 REFERENCES

A. FS O-F-241 - Fertilizers, Mixed, Commercial.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1. Soil Amendment Fertilizer.
2. Turf Starter Fertilizer.
3. Turf Maintenance Fertilizer.
4. Weed Control Herbicide.

B. Submit sod certification for grass species and location of sod source.

C. Submit compost testing data to confirm product meets specified parameters.

D. Submit topsoil testing data to confirm product meets specified parameters.

E. Sod Establishment Irrigation Schedule.

F. Turf Maintenance Irrigation Schedule.

1.4 QUALITY ASSURANCE

A. Sod:

1. Minimum age of 12 months, with root development that will support its own weight without tearing, when suspended vertically by holding the upper two corners.
2. Qualifications: Sod Producer shall be company specializing in sod production and harvesting with minimum five years of experience.

B. Regulatory Requirements

1. Comply with regulatory agencies for fertilizer and herbicide composition.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Division 1.

B. Packaged materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with State and Federal laws, as applicable.

C. Sod

1. Deliver sod on pallets, in rolls. Protect exposed roots from dehydration.
2. Do not deliver more sod than can be laid within 24 hours.

D. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

E. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

1.6 PROJECT/SITE CONDITIONS

A. Do not install plant life when ambient temperatures may drop below 45 degrees F or rise above 90 degrees F.

1.7 SEQUENCING AND SCHEDULING

A. Coordinate work under provisions of Division 1.

B. Coordinate sod placement work with irrigation system work specified and in the Drawings.

C. Irrigation system shall be fully functional, including the control system, prior to installation of any plant material.

1.8 WARRANTY

A. Contractor shall warrant work as provided by the General and Supplementary Conditions and Division 01 Specifications.

PART 2 - PRODUCTS

2.1 PRODUCTS & MATERIALS

A. Substitutions or equivalent products shall be in accordance with Division 01 Specifications.

B. Topsoil Material:

1. Import 12-IN compacted depth at all sod areas. Depth shall exceed 12-IN if necessary to fill area to design finish grade.
2. Topsoil shall be amended per Division 32 specifications “Turf and Grasses” and “Plants”.
3. Topsoil shall be free of refuse, constituents toxic or otherwise deleterious to plant growth, woody vegetation, stumps or roots, brush, stones, and clay lumps. Sod and herbaceous growth such as grass need not be removed, but shall be thoroughly broken up and mixed with the soil.
4. Imported Topsoil: Grading and Quality Requirements: Topsoil shall conform to the requirements shown below:

a. Topsoil Material Gradation:

Sieve Size	Percent Passing
1-inch	100

3/8-inch	85-100
No. 8	50-80
No. 200	0-20

b. Topsoil Quality:

Test	Test Method	Requirements
Sampling Aggregate	ASTM D 75	-
Sieve Analysis	ASTM C 136 & C 117	Table - 2.1 | B. | 2. | a.
General Texture	ASTM D 422-63	Sand: < 70% Silt: < 70% Clay: < 30%
Organic Content	AASHTO T 194	> 2%
Soluble Salts	ASTM D 5298-10	< 2
PH	ASTM E 70	6.5 to 7.5

c. Topsoil shall be amended per Division 32 specifications "Turf and Grasses" and "Plants".

5. Imported Topsoil: Representative samples from proposed topsoil source shall be tested for all quality items noted in 2.1, B., 2., b. above, by a recognized commercial or governmental agency and copies of the testing results shall be furnished to the landscape architect by the contractor. Coordinate with Submittals, Part 1 of this section.

C. Turf Sod: ASPA Certified Field grown grade; cultivated grass sod; type indicated below; with strong fibrous root system, free of stones, burned or bare spots; containing no more than 5 weeds per 1000 sf. Sod shall be from an established regionally local grower.

1. Sod shall be 80/20 Bluegrass/Perennial Ryegrass blend, submit for approval prior to ordering.

D. Soil Amendment: Compost

1. Compost shall be measured by the cubic yard at the point of loading.
2. Compost shall be a well decomposed, stable, weed free organic matter source. It shall be derived from agricultural, food, or industrial residuals; biosolids (treated sewage sludge); yard trimmings or source-separated or mixed solid waste. The product shall contain no substances toxic to plants, will possess no objectionable odors and shall not resemble the raw material from which it was derived.
3. Compost shall meet the following parameters:

a. pH – Acceptable Range: 6.0 – 7.0
b. Soluble Salts – Acceptable Range: 0-7 mmhos/cm (1:5 by weight)
c. Maturity Indicators:
    1) Ammonia N / Nitrate N Ratio - < 4
    2) Carbon to Nitrogen Ration < 12

d. Particle size: 98% pass through 1/2-inch screen.
e. Physical contaminants (inert matter): less than 1%
f. Submit lab testing indicating compliance with the parameters above. Lab testing shall also provide the following information: Bulk Density; % Inorganics; %

Moisture; Particle Size Distribution, Primary & Secondary Nutrients; Trace Elements; Organic Matter Expressed in Percentage and Pounds per CY.

F. Soil Amendment: Pre-Plant Fertilizer

1. NPK Fertilizer: Wilbur-Ellis Perfection 16-20-0.
2. Humic Acid: Live Earth Humate Soil Conditioner.
3. Wilbur-Ellis Perfection GYPSUM granular.

G. Soil Amendment: Turf Starter Fertilizer

1. NPK Fertilizer: Wilbur-Ellis Perfection Mix #29 15-15-15 with minors.

H. Turf maintenance Fertilizer:

1. NPK Fertilizer: Wilbur-Ellis Perfection 16-16-16 (50% of nitrogen from Duration 90).

I. Water: Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass.

J. Pre-Emergent Herbicide: Tupersan Herbicide Wettable Powder, Tenacity, or approved equal.

K. Weed Control Herbicide:

1. Selective Broadleaf Weed Control: 2,4-D Amine Weed Killer.
2. Broad Spectrum Herbicide: Roundup Pro.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that prepared topsoil is ready to receive the work of this Section.

B. Beginning of installation means acceptance of existing site conditions.

C. All planting areas shall be weed free at the time of sod installation.

D. Irrigation system and irrigation control system shall be fully functional prior to placement of sod.

3.2 LANDSCAPE FILL

A. Refer to Section 312000 for excavation at topsoil areas.

B. Upon approved preparation of subgrade, placement of Landscape Fill shall proceed.

C. Place topsoil at locations indicated on the drawings, at all tree pits and sod areas. Place in maximum 9-inch loose lifts and compact to 87% per ASTM D698.

D. Place topsoil at a minimum compacted depth of 12-inches.

E. Place required topsoil for tree planter pits. Refer to section 329300 for more information.

F. Surface of topsoil shall be smooth, even surface. Remove ridges and fill depressions as required to meet finish grades. Leave topsoil areas clean and raked, ready to receive landscaping soil amendments.

G. Coordinate placement and compaction of topsoil with Specification Section 329300.

3.3 SOIL AMENDMENTS

A. Soil Amendments: After approximate finished grades have been established soil shall be conditioned and fertilized in the following manner. Soil amendments shall, at the following rate, be uniformly spread and cultivated thoroughly by means of mechanical tiller into the top soil layer; minimum 4 Inch depth and maximum 6 Inch depth.

1. Application Rates:

a. Soil Amendment: Compost – 2 CY per 1000 SF
b. Soil Amendment: NPK 16-20-0 – 3 lbs per 1000 SF
c. Soil Amendment: Humic Acid – 25 lbs per 1000 SF
d. Soil Amendment: Gypsum – 50 lbs per 1000 SF

B. Placement and tilling of soil amendments listed in this section must be completed prior to sod placement. Contractor shall photo document installation of all soil amendments and mechanical tilling and provide to the architect for review and approval. Contractor shall provide product receipts for all products specified in this section for review and approval prior to granting of substantial completion. Receipts shall list job name, contractor name, date and detailed product and quantity information.

3.4 FINISH GRADING

A. Upon completion of soil amendment operations, finish grading operations shall begin.

B. Coordinate with Section 312000, Earth Moving.

C. Grade topsoil to smooth, even surface with loose, uniformly fine texture. Remove ridges and fill depressions, as required to meet finish grades. Finish grade of topsoil related to adjacent site elements shall be:

1. Sod Areas: 1-IN below top of adjacent pavement, valve box, vault, etc.

D. Remove all roots, weeds, rocks and foreign material on the surface. Coordinate with Section 328400 for removal of debris brought to the surface during trenching operations.

E. Prior to placement of sod, topsoil shall be water settled through application of .5-inch of precipitation through the irrigation system. Coordinate with section 328400. All areas of settlement shall be top dressed with approved topsoil material to provide a smooth, even

surface. Any settlement of soils after placement of sod shall be corrected by the contractor at no cost to the owner. Do not allow erosion or rilling of topsoil.

F. Tolerance: Top of Topsoil – Plus .25-inch, no minus.

3.5 SOD PLACEMENT

A. General:

1. Topsoil placement, soil amendments placement and tilling, compaction/water settling and finish grading shall be completed and approved by the landscape architect prior to sod placement.
2. Do not place sod when ground is too wet or too dry.
3. Temperature shall be between 45 F and 90 F for a 24 hour period.
4. Wind shall be less than 20 mph.

B. Turf Sod Placement

1. Moisten prepared surface immediately prior to laying sod.
2. Lay sod immediately after delivery to site to prevent deterioration.
3. Lay sod tight with no open joints visible, and no overlapping; stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces.
4. Lay smooth. Align with adjoining grass areas.
5. Place top elevation of sod soil layer (not grass blades) ½ inch below adjoining edging paving, curbs and sidewalks.
6. On 3:1 or greater slopes, lay sod perpendicular to slope and secure every row with wooden pegs at maximum 2 feet on center. Drive pegs flush with soil portion of sod.

C. Soil Amendments Turf Starter: Final operation after sod placement, and prior to irrigation, apply to the sod surface. Water into sod with irrigation system.

1. Application Rates: Turf Starter – Mix #29 15-15-15: 3 lbs per 1000 SF.

D. Placement of Turf Starter fertilizer listed in this section must be completed immediately after sod placement. Contractor shall photo document installation of turf starter fertilizer and provide to the Architect for review and approval. Contractor shall provide product receipts for all products specified in this section for review and approval by the landscape architect prior to granting of Substantial Completion.

E. Water sodded areas immediately after installation of turf starter fertilizer.

F. After initial irrigation of sod, allow soil to dry sufficiently for rolling. Roll sodded areas to ensure good bond between sod and soil and to remove minor depressions and irregularities. Roller not to exceed 100 lbs.

3.6 SOD ESTABLISHMENT

A. General: Starting immediately after sod placement, sod establishment will begin. Irrigation, mowing, weed control and fertilization shall be the responsibility of the contractor as defined herein. Protect sodded area with signs to prevent traffic throughout the establishment period.

1. The establishment period shall have a duration of thirty (30) days and be between March 15th and November 1st of each year. This period shall stop for the season if daily low temperature drops below 40 F for three consecutive days and will reactivate the following spring on March 15th.

B. Irrigation:

1. Contractor shall submit for approval a proposed "Sod Establishment Irrigation Schedule". This schedule shall include Zone designation, days per week, cycles per day and cycle run time. Include targeted daily and weekly precipitation rates for each zone based on current climatic conditions.
2. Water shall be applied to moisten the soil to approximately 2-inch depth but avoid overwatering and creating areas of standing water or under watering and creating areas of dry soil.
3. Contractor shall monitor irrigation daily to identify areas receiving too much or too little precipitation.
4. Slopes shall be monitored for erosion and corrective action taken immediately.
5. Once the sod has been mown three times, approximately 4 weeks, the frequency of irrigation shall be reduced and run times increased to provide water deeper into the soil.

C. Mowing:

1. Mowing shall begin when the grass blades reach a height of approximately 2.5-Inches.
2. All cutting equipment shall be sharp and mowers shall be adjusted precisely to the proper mowing height.
3. Mowing heights during the establishment period shall be 2.5-Inch to 3.0-Inch.
4. Mowing shall occur every 7 days or more often if growth dictates. At no point shall the height of the turf grass be more than 3.5-Inches.
5. Grass clippings shall be collected and removed from the site.
6. Coordinate irrigation schedule with mowing schedule. At no time shall mowing occur if soil is wet and rutting may occur.

D. Weed Control: Control growth of weeds throughout establishment period.

E. Upon completion of the establishment period the Turf Maintenance period shall begin.

3.7 TURF MAINTENANCE

A. Maintenance shall be according to the following standards. All areas shall be mown, weeded and cultivated at intervals of not more than seven (7) days. Watering, trash and debris removal, mowing, rolling, edging, trimming, fertilization, spraying and pest control, as required, shall be included in the maintenance period. Cleaning of street gutters and sidewalks shall be included. The Contractor shall be responsible for maintaining adequate protection of the area. Damaged

areas shall be repaired at the Contractor's expense. The Contractor shall reseed all spots or areas within the lawn where normal turf growth is not evident.

1. The Turf Maintenance Period shall have a minimum duration of sixty (60) days and continue until the date of Substantial Completion. Turf Maintenance period shall be between March 15th and November 1st of each year. This period shall stop for the season if daily low temperature drops below 40 F for three consecutive days and will reactivate the following spring on March 15th.

B. Irrigation:

1. Contractor shall submit for approval a proposed "Turf Maintenance Irrigation Schedule". This schedule shall include Zone designation, days per week, cycles per day and cycle run time. Include targeted daily and weekly precipitation rates for each zone based on current climatic conditions.
2. Water shall be applied to moisten the soil appropriately for the current, seasonal climatic conditions. Avoid overwatering and creating areas of standing water or under watering and creating areas of dry soil.
3. Irrigation shall be monitored weekly to identify areas receiving too much or too little precipitation.
4. Slopes shall be monitored for erosion and corrective action taken immediately.
5. Coordinate areas where irrigation overlaps sodded areas to ensure proper soil moisture rates exist.

C. Mowing:

1. Mowing shall occur at intervals of not more than seven (7) days or more often if growth dictates.
2. All cutting equipment shall be sharp and mowers shall be adjusted precisely to the proper mowing height.
3. Mowing heights during the maintenance period shall be 2.5-Inch – At no point shall the height of the turf grass be more than 3.5-inches.
4. Grass clippings shall be collected and removed from the site.
5. Coordinate irrigation schedule with mowing schedule. At no time shall mowing occur if soil is wet and rutting may occur.
6. Edges shall be trimmed as needed for neat appearance.

D. Weed Control:

1. Control growth of weeds throughout maintenance period. Inspect turf areas every seven (7) days for weed growth.
2. Utilize 2,4-D broadleaf weed killer to control weeds in all turf areas.

E. Fertilization – Two required applications:

1. Turf Maintenance Fertilizer (16-16-16) shall be applied at a rate of 3 lbs per 1000 SF, approximately 15 days following start of Turf Maintenance period.
2. Turf Maintenance Fertilizer (16-16-16) shall be applied at a rate of 5 lbs per 1000 SF, approximately 60 days following start of Turf Maintenance period.

F. Continuously maintain the entire project area during the progress of work until the date of Substantial Completion.

3.8 FIELD QUALITY CONTROL

A. Perform field inspections under provisions of Division 01 Specifications.

B. Coordinate field inspections with Specification Sections 328400.

C. Contractor Performed Inspections: The contractor shall perform the following applicable inspections and provide written confirmation of completed and successful installation to the Architect.

1. Soil Amendments: Provide required photographs and product receipts demonstrating successful placement and tilling of specified soil amendments.
2. Sod – Turf Starter Fertilizer: Provide required photographs and product receipts demonstrating successful placement of Turf Starter Fertilizer.
3. Turf Maintenance – Maintenance Fertilizer: Provide required photographs and product receipts demonstrating successful placement of Turf Maintenance Fertilizer.

D. Landscape Architect Performed Inspections:

1. Amended & Graded Topsoil: The contractor shall schedule one site visit with the landscape architect to inspect topsoil preparation prior to sod installation. All topsoil placement, soil amendments placement and tilling, compaction/water settling and finish grading shall be completed prior to request for inspection. Do not proceed with sodding operations until prepared topsoil has been approved.

3.9 CLEANING

A. After all sodding operations have been completed; remove all trash, excess soil or rubbish from the property. All scars, ruts or other marks in the ground caused by this work shall be repaired and the ground left in a neat and orderly condition throughout the site. Contractor shall pick up all trash resulting from this work no less frequently than each day before leaving the site. All trash shall be removed completely from the site. The Contractor shall leave the site area broom-clean and shall wash down all paved areas within the Contract area, leaving the premises in a clean condition acceptable to the Architect and Construction Manager.

3.10 PROTECTION

A. Protect sodded areas with warning signs until date of Substantial Completion.

END OF SECTION 329200

SECTION 334000 - STORM DRAINAGE UTILITIES

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Storm drainage piping, fittings, and accessories.
2. Catch basins, manholes, clean-outs, grates and frames.

1.2 RELATED SECTIONS

A. Division 01 Sections.

B. Division 31 Section "Earth Moving" utility trench excavation, bedding and backfill.

C. Idaho Standards for Public Works Construction, Current Edition.

D. Geotechnical Engineering Evaluation as prepared by Atlas Technical Consultants.

1.3 SUBMITTALS

A. Submit under provisions of Division 01

B. Product Data: For each type of product indicated.

C. Shop Drawings:

1. Catch basins and in-line drains: Include plans, elevations, section, details, frames, covers and grates.

D. Field quality-control reports.

E. Project Record Documents

1. Submit documents under provisions of Division 01.
2. Accurately record location of pipe runs, connections, catch basins, cleanouts, and invert elevations each day.
3. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities each day.

F. Operations & Maintenance Data: Submit manufacturer’s written Operations & Maintenance data for all components & accessories.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Conform to requirements of agency having jurisdiction.
2. Piping materials shall bear label, stamp, or other markings of the specified testing agency.

B. Comply with ASTM D 2321 and installation of thermoplastic drainage piping.

1.5 WARRANTY

A. Contractor shall warrant work as provided by the General and Supplementary Conditions and Division 01 Specifications.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Substitutions or equivalent products shall be in accordance with Division 01 Specifications.

2.2 PE PIPE AND FITTINGS

A. Corrugated PE Drainage Pipe and Fittings NPS 3 to NPS 10: AASHTO M 252M, Type S, with smooth waterway for coupling joints.

1. Soiltight Couplings: AASHTO M 252M, corrugated, matching tube and fittings.

B. Corrugated PE Pipe and Fittings NPS 12 to NPS 60: AASHTO M 294M, Type S, with smooth waterway for coupling joints.

1. Soiltight Couplings: AASHTO M 294M, corrugated, matching pipe and fittings.

2.3 PVC PIPE AND FITTINGS

A. PVC Drain Piping:

1. Pipe: ASTM D 3034, SDR 35, PVC drainage pipe with bell-and-spigot ends for gasketed joints.
2. Fittings: ASTM D 3034, PVC with bell ends.
3. Gaskets: ASTM F 477, elastomeric seals.

2.4 NONPRESSURE TRANSITION COUPLINGS

A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:

1. For Concrete Pipes: ASTM C 443, rubber.
2. For Cast-Iron Soil Pipes: ASTM C 564, rubber.
3. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
4. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

C. Shielded, Flexible Couplings:

1. Description: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.

D. Ring-Type, Flexible Couplings:

1. Description: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.

2.5 CLEANOUTS

A. Per drawings and details.

2.6 CATCH BASINS

A. Standard Precast Concrete Catch Basins:

1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor
3. Riser Sections: 4-inch minimum thickness, diameter and lengths to provide depth indicated.
4. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
5. Adjusting Rings: Interlocking rings with level or sloped edge in thickness and shape matching catch basin frame and grate. Include sealant recommended by ring manufacturer..
6. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match diameter frame and grate.
7. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
8. Frames and Grates: ASTM A 536, Grade 60-40-18, ductile iron designed for A-16, structural loading. Include flat grate with small square or short-slotted drainage openings.

    a. Grate Free Area: Approximately 50 percent unless otherwise indicated.

2.7 ACCESSORIES

A. Warning Tape: Install per specification section 312000.

PART 3 – EXECUTION

3.1 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

3.2 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

C. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

D. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.

E. Install gravity-flow, nonpressure drainage piping according to the following:

1. Install piping pitched down in direction of flow.
2. Install PE corrugated sewer piping according to ASTM D 2321.
3. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.

3.3 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Install piping so cleanouts open in direction of flow in drainage pipe.

1. Construct cleanout as specified on drawings.

3.4 CATCH BASIN INSTALLATION

A. Set frames and grates to elevations indicated.

3.5 CONCRETE PLACEMENT

A. Place cast-in-place concrete according to ACI 318.

3.6 CONNECTIONS

A. Connect non-pressure, gravity-flow drainage piping to building storm drains.

3.7 IDENTIFICATION

A. Materials and their installation are specified in Division 31 Section "Earth Moving." Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.

3.8 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate reports for each system inspection.
2. Defects requiring correction include the following:

    a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
    d. Infiltration: Water leakage into piping.
    e. Exfiltration: Water leakage from or around piping.
    f. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
    g. Re-inspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to requirements of authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate report for each test.
5. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction, UNI-B-6, and the following:
6. Exception: Piping with soiltight joints unless required by authorities having jurisdiction.

    a. Option: Test plastic piping according to ASTM F 1417.
    b. Option: Test concrete piping according to ASTM C 924.

C. Leaks and loss in test pressure constitute defects that must be repaired.

D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

E. Refer to Division 31 Section "Earth Moving" for trenching compaction.

3.9 CLEANING

A. Clear interior of piping and structures of dirt and other superfluous material as work progresses.

B. Flush piping to remove collected debris. Remove collected debris from all manholes, catch basins and sand and grease traps. Debris shall not enter infiltration facilities.

C. Place plugs in ends of uncompleted pipe at end of day or whenever work stops.

D. After substantial completion, remove temporary filter fabric from catch basin frames.

3.10 PROTECTION

A. Protect finished installation under provisions of Division 01.

END OF SECTION 334000