BRIC

1233 NW NORTHRUP STREET, SUITE 100
PORTLAND, OR 97209

T 503 595 4900

PROJECT MANUAL

for

Seaside New Middle School/ High School

Seaside School District
1801 S. Franklin Street, Seaside, OR 97138

Bid Package 2
Permit Set
June 15, 2018

SET #_____

PROJECT MANUAL

for

Seaside New Middle School/ High School

Seaside School District
1801 S. Franklin Street
Seaside, OR 97138

BRIC Architecture, Inc.
1233 NW Northrup Street, Suite 100
Portland, OR 97209 **T** 503 595 4900

June 15, 2018

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END OF SECTION

DOCUMENT 00 31 00
AVAILABLE PROJECT INFORMATION

PART 1 GENERAL

1.01 EXISTING CONDITIONS

A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders but will not be part of the Contract Documents, as follows:

B. Site and Utility Survey:
   1. A copy of a topographic survey with respect to the project site is included with the Drawings for information only and is not to be considered a part of the Contract Documents. (Refer to Bid Package 1)
   2. This survey identifies grade elevations prepared primarily for the use of Architect in establishing new grades and identifying natural water shed.
   3. The Owner does not warrant the correctness of the topographic survey or of any interpretation, deduction, or conclusion given relative to the information contained therein.
   4. This survey identifies conditions of existing construction prepared primarily for the use of Architect in establishing the extent of the new versus existing work.
   5. The existence and location of underground and other utilities and construction indicated as existing are not guaranteed.
   6. Verify all information shown.

C. Geotechnical Report:
   1. Copies of geotechnical reports with respect to the building site are Available for information only and are not to be considered a part of the Contract Documents.
      a. Title: Report of Geotechnical Engineering Services.
         1) Date: November 20, 2017.
         2) Prepared By: GeoDesign.
      b. Title: Addendum 1 - Additional Recommendations for Foundations, Topsoil Placement, and Walls.
         1) Date: June 12, 2018.
         2) Prepared By: GeoDesign.
   2. These reports identify properties of below grade conditions and offer recommendations for the design of foundations, prepared primarily for the use of Architect.
   3. The recommendations described shall not be construed as a requirement of the Contract.
   4. These reports, by their nature, cannot reveal all conditions that exist on the site. Should subsurface conditions be found to vary substantially from these reports, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the Contract Sum accruing to Owner.
   5. The Owner does not warrant the correctness of the subsurface investigation reports or of any interpretation, deduction, or conclusion give in the reports relative to subsoil conditions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF DOCUMENT

DOCUMENT 00 72 00
GENERAL CONDITIONS

FORM OF GENERAL CONDITIONS

1.01 THE GENERAL CONDITIONS APPLICABLE TO THIS CONTRACT IS ATTACHED FOLLOWING THIS PAGE.

1.02 RELATED REQUIREMENTS

A. Section 01 42 16 - Definitions.

END OF DOCUMENT

AIA® Document A201™ – 2007

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)
A new Seaside School District campus, which will include the following components, which are further:

(1) Closing existing buildings that operate in the City of Seaside's tsunami zone;

(2) Constructing a new facility on land donated by Weyerhaeuser Company, which will operate as Seaside High School and Broadway Middle School; and

(3) Renovation and expansion of Seaside Heights Elementary School.

THE OWNER:
(Name and address)
SEASIDE SCHOOL DISTRICT 10
1801 SOUTH FRANKLIN STREET
SEASIDE, OREGON 97138

THE ARCHITECT:
(Name and address)
BRIC ARCHITECTURE, INC.
1233 NW NORTHRUP STREET, SUITE 100
PORTLAND, OREGON 97209

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

THESE GENERAL CONDITIONS APPLY TO THE AGREEMENT BETWEEN THE OWNER AND CONTRACTOR, AIA DOCUMENT A133-2009, AS AMENDED, DATED JULY 3, 2017.

TABLE OF ARTICLES

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(Numbers and Topics in Bold are Section Headings)

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor identified on page 1 of these General Conditions (hereinafter the "Agreement") and consist of the Agreement, Conditions of the Contract (these General Conditions and any Supplementary Conditions or other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties and supersedes all prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect and the Contractor shall, however, be entitled to performance and enforcement of obligations of the other under the Contract intended to facilitate performance of their respective duties.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required of the Contractor by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, Drawings, Specifications, and other documents, including those in electronic form, of the tangible creative work performed by the Architect and the Architect's consultants for the Project under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 THE INDEMNITEES **The "Indemnitees" are Owner and its officers, directors, volunteers, agents, representatives, and employees.**

§ 1.1.9 AFFILIATED ENTITY OR AFFILIATED ENTITIES

The term "Affiliated Entity" shall mean the Contractor (if self-performing a portion of the Work), a parent, subsidiary, affiliate, or other entity having common ownership or management with the Contractor; any entity in which any stockholder in, or management employee of, the Contractor, or the Contractor itself, owns any interest in excess of ten percent (10%) in the aggregate; or any person or entity that has the right to control the business or

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affairs of the Contractor. The term "Affiliated Entity" includes any member of the immediate family of any person identified above.

§ 1.1.10 CONSTRUCTION MANAGER/GENERAL CONTRACTOR

All references to the term "Contractor" in these General Conditions shall mean the Construction Manager/General Contractor identified in the Agreement.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.2 The terms of any document that forms the Contract are subject to the following order of precedence:

.1 Modifications;

.2 The Agreement;

.3 These General Conditions and supplementary conditions;

.4 Drawings, Specifications, and Addenda issued before execution of the Contract, subject to Section 1.2.4;

.5 Other documents incorporated by the terms of the Contract Documents.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings. Dimensions not expressly provided in the Contract Documents are to be computed, rather than determined by scale or rule.

§ 1.2.4 If there is an inconsistency within or between (1) any Drawings, Specifications, or Addenda issued before execution of the Contract, or (2) any Drawings, Specifications, or Addenda and applicable standards, codes, and ordinances, and the inconsistency is not clarified by a Modification or by the Architect, then the Contractor shall provide the better quality or greater quantity of Work without requiring a change to the Contract Sum. The terms and conditions of this Section 1.2.4, however, shall not relieve the Contractor of any of the obligations set forth in Section 3.2.

§ 1.2.5 The organization of the Specifications into divisions, sections and articles, and the arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects, or substitute for those documents that may be used on the Project, or (4) the titles of or terms defined in the Owner's policies incorporated in these General Conditions.

§ 1.4 INTERPRETATION

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and

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other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. The submittal or distribution of the Instruments of Service to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 [Deleted]

§ 2.1.3 Notwithstanding anything to the contrary in any Contract Document, no officer, director, trustee, partner, authorized representative, employee, student, volunteer, agent, or other representative of the Owner shall have any personal liability to the Contractor or any other person or entity other than the Owner for any acts or omissions arising out of or relating to these General Conditions or the Agreement, whether based on tort, contract, statute, administrative laws, or otherwise.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. Any request made after the commencement of the Work shall not serve as a basis for the Contractor to stop the Work.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 Except to the extent required for execution of the Work and requested by the Contractor in writing, the Owner shall not furnish surveys, studies, or reports regarding physical characteristics, legal limitations and utility locations for the site of the Project, but shall provide a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness after receiving the Contractor's written request for such information or services.

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§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner or the Architect shall provide to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2. Additional copies may be purchased by the Contractor at the cost of reproduction and handling.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

§ 2.3.1 If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

§ 2.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, commence and continue to carry out the Work, including without limitation the correction of any deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

§ 2.4.2 If the Contractor's default or neglect results in a hazard to the safety of persons or property, the Owner may immediately commence or continue to carry out any Work necessary to mitigate the hazard without prior notice to the Contractor.

§ 2.4.3 The Owner's right to carry out the Work in this Section 2.4 shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity.

§ 2.5 The Owner may notify the Contractor that it needs to exclude or remove from the Project site any or all employees, agents, suppliers, or representatives of the Contractor or its Subcontractors who threaten the safety of others or are disruptive to the Project or the Owner's operations and activities. The Contractor will supply replacement personnel promptly after receiving notice of the exclusion or removal. Each replacement must have qualifications and experience comparable to or better than the individual or entity being replaced and be reasonably acceptable to the Owner. Nothing in this Section requires the Contractor to take any particular employment or contract action with regard to an employee or Subcontractor.

§ 2.6 RIGHTS and REMEDIES

Consistent with Section 13.4, the rights described in Sections 2.3 through 2.5 shall be in addition to, and not in restriction of, the Owner's other rights or remedies.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.1.1 The Contractor and each of its Subcontractors must be licensed with the Oregon Construction Contractors Board at the time of solicitation of any work and throughout the entire course of the Work. The Contractor shall maintain all required bonding and insurance required by the State of Oregon and the Contract Documents throughout the entire course of the Work.

§ 3.1.1.2 The Contract is applicable to contractors who are owned or controlled by, or act as agents of, the Contractor for purposes of the Project.

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§ 3.1.2 The Contractor shall supervise, coordinate, and perform the Work in accordance with the Contract Documents in a professional, safe, and workmanlike manner and in accordance with all laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and professional standards applicable to the industries and trades involved, including without limitation strict compliance with all applicable federal, state, and local laws and building codes and certification requirements applicable to the Work.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Owner or the Architect in the administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.1.4 Unless otherwise directed by the Architect, the Contractor shall perform all Work in accordance with product manufacturers' recommendations or directions for best results. No preparatory step or installation procedure may be omitted unless specifically authorized by the Contract Documents or at the direction of the Architect. Conflicts among manufacturers' directions or the Contract Documents shall be resolved by the Architect.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents. In addition:

.1 The Contractor and each Subcontractor, as a condition precedent to commencement of the Work, shall:

(a) become familiar with the location, condition, layout, and nature of the Project Site and surrounding areas and generally prevailing climate conditions;

(b) review all analyses, studies, and test data available to the Contractor concerning the conditions of the Project site;

(c) inspect the location of the Project site and satisfy themselves as to its condition, including all observable structural, surface, and subsurface conditions to the extent information is provided by the Architect and can be viewed;

(d) evaluate the availability and cost of labor and trade Subcontractors and the availability and cost of materials, tools, and equipment; and

(e) determine (i) that the Contract Sum and GMP are just and reasonable compensation for all the Work, including all foreseen and foreseeable construction risks, hazards, and difficulties for which the Contractor is responsible under the Contract Documents, (ii) that the Contract Time is adequate for the performance of the Work, and (iii) that the means and methods of performing the Work will not result in any lateral or vertical movement of any adjacent structure.

The Contractor or Subcontractor must notify the Owner in writing before commencing the Work if it determines that it cannot satisfy one or more of these conditions.

.2 The Owner shall not be required to make any adjustment in either the Contract Sum or the Contract Time in connection with any failure by the Contractor or any Subcontractor to have complied with the requirements of this Section 3.2.1.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner and, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect and the Owner any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Owner or the Architect may require. It is recognized that the

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Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall:

.1 promptly report to the Owner and the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require;

.2 include within the Guaranteed Maximum Price all Costs of the Work that are necessary for the Project to comply with all applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.1 through 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.1 through 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations and could not have recognized the applicable error, inconsistency, omission, or difference in the exercise of normal diligence, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, recognized in the exercise of normal diligence.

§ 3.2.5 Unless otherwise specified in the Contract Documents, the Contractor shall confirm the location of each utility and shall excavate and dispose of each on-site utility. The Owner has made available to the Contractor, and the Contractor has studied, the results of such test borings and information that the Owner has concerning subsurface conditions and site geology. At the Owner's request, the Contractor will make available to the Owner the results of any other site investigation, analyses, studies, or other tests conducted by or that are in possession of the Contractor or any of its agents. The Contractor shall exercise special care in executing subsurface work in proximity of known subsurface utilities, improvements, and easements.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise, coordinate, and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Owner or the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner or the Architect shall be responsible for any loss or damage arising from those Architect- or Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

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§ 3.3.4 The Contractor must notify the Owner at least ten (10) days prior to the interruption of any utility or operating system, regardless of the area it services. The specific schedule for all interruptions in services must be coordinated through the Owner's Representative.

§ 3.3.5 The Contractor and its Subcontractors may not use the Owner's tools, equipment, or materials unless authorized in advance by the Owner's Representative.

§ 3.3.6 If the Contractor reasonably believes that suspension of the Work is warranted by reason of unforeseen circumstances that could adversely affect the quality of the Work if the Work were continued, the Contractor shall immediately notify the Owner and the Architect and describe with particularity the reasons therefor. Except as stated elsewhere in the Contract Documents or in an emergency, the Contractor shall not suspend the Work until it receives approval from the Owner.

§ 3.3.7 It is understood and agreed that the relationship of Contractor to Owner shall be that of an independent contractor under ORS 670.600. Nothing contained in this Agreement or inferable from this Agreement shall be deemed or construed to (a) make Contractor the agent, servant, or employee of the Owner; or (b) create any partnership, joint venture, or other association between Owner and Contractor. Any direction or instruction by Owner or any of its authorized representatives in respect to the Work shall relate to the results the Owner desires to obtain from the Work, and shall in no way affect Contractor's independent contractor status.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the prior written consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them. The Contractor shall hire all personnel for the proper and diligent prosecution of the Work, and maintain labor peace for the duration of the Project. In the event of a labor dispute, the Contractor shall not be entitled to any increase in the Contract Sum.

§ 3.4.4 Including, but not limited to the specific requirements of Section 10.1.1, Contractor, its Subcontractors, and vendors shall bear responsibility for compliance with all federal and state laws, regulations, guidelines, and ordinances pertaining to worker safety and applicable to the Work. Contractor further recognizes that the Owner and Architect do not owe the Contractor any duty to supervise or direct Contractor's work so as to protect the Contractor from the consequences of Contractor's own conduct.

§ 3.5 WARRANTY

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect or the Owner, the Contractor shall furnish satisfactory evidence about the kind and quality of materials and equipment.

§ 3.5.2 CORRECTION OF WORK If, after 10 days' notice, the Contractor fails to proceed to cure any breach of this warranty, the Owner may have the defects corrected and the Contractor and its surety, if any, shall be liable for all expense incurred. In case of an emergency where, in the opinion of the Owner or the Architect, delay would cause serious loss or damage, if any, corrective work may be undertaken without advance notice to the Contractor, but the

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Contractor and its surety shall remain liable for all expenses incurred. The remedies stated in this Section 3.5 are not exclusive, but are cumulative of any other Owner remedies.

§ 3.5.3 THIRD-PARTY WARRANTIES

.1 The Contractor shall obtain from Subcontractors, manufacturers, and suppliers written guarantees and warranties consistent with any requirements of the Contract Documents. If the Contract Documents do not contain requirements for written guarantees or warranties, then the Contractor will obtain the optimum terms and longest periods reasonably obtainable. The documentation must also include all maintenance and operational documentation required to sustain the warranties.

.2 All guarantees or warranties of third parties furnished to the Contractor or Subcontractor, including without limitation from any manufacturer or supplier, shall be deemed to run for the benefit of the Owner.

.3 The Contractor shall deliver to the Owner via the Architect electronic or hard-copy versions of all as-built documents and guarantees and warranties on materials, systems, and equipment furnished by all manufacturers and suppliers to the Contractor and all its Subcontractors, with duly executed instruments properly assigning the guarantees and warranties to the Owner. These warranties in each bound volume shall be grouped together by trade and properly indexed. The Contractor shall assign and deliver to the Owner all manufacturers' warranties not later than the date of Substantial Completion.

.4 **Until Substantial Completion, the Contractor shall perform and document all required maintenance of equipment and systems and maintain in force all warranties.**

§ 3.5.4 ASSIGNMENT OF WARRANTIES

The Contractor hereby assigns to the Owner all warranties and guarantees of all Subcontractors and Sub-subcontractors, but the assignment shall not relieve the Contractor of its warranty obligations to the Owner under these General Conditions and other Contract Documents.

§ 3.5.5 REMEDIES

Consistent with Section 13.4, the remedies stated in this Section 3.5 are not exclusive, but are cumulative of any other Owner remedies.

§ 3.6 TAXES

The Contractor shall pay all necessary local, county, and state taxes, income tax, compensation tax, social security, and withholding payments as required by law. Contractor hereby RELEASES, INDEMNIFIES, AND HOLDS HARMLESS Owner from any and all claims and demands made as a result of the failure of Contractor or any Subcontractor to comply with the provisions of any or all such laws and regulations.

§ 3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Owner shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily

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found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines, after considering Section 3.2, that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. For the purposes of these Contract Documents, the term "wetland" includes wetlands and water bodies subject to the federal Clean Water Act and parallel state and local rules, statutes, and regulations. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- **.1** allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- **.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum and in the allowances; and
- **.3** whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2. Savings realized on an allowance shall be returned to the Owner as a reduction in the Contract Sum.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner in sufficient time to avoid delay in the Work

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall continuously employ a competent superintendent, project manager, and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent and project manager shall represent the Contractor, and communications given to the project manager or superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The project manager and the superintendent shall be those persons named in the Contractor's proposal.
§ 3.9.3 So long as the project manager and the superintendent remain employed by the Contractor, the Contractor may not otherwise remove or replace the project manager, superintendent, or assistants, or cause them to leave the Project for any reason, including without limitation to work on other projects or take extended vacations, without 45 days' advance written notice to and the prior consent of the Owner. The Owner shall be consulted by the Contractor with respect to replacement personnel pursuant to the requirements of the Contract.

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§ 3.9.4 New or replacement project managers, superintendents, and assistants must be qualified and must have adequate experience with similar projects. The Contractor shall deliver to the Owner résumés of proposed new or replacement project managers, superintendents, and assistants.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's approval a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work within the Contract Time.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval. The Architect's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

§ 3.11.1 The Contractor shall maintain at the site for the Owner one record as-built copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one record copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These as-build documents shall incorporate all changes and substitutions to the Work, including without limitation changes or substitutions arising from change orders, construction change directives, and details clarified by requests for information, supplemental instructions or approved shop drawings. The Contractor's as-built documentation shall be available to the Architect and the Owner during the course of the Project.

§ 3.11.2 The Contractor shall maintain all approved permit drawings in a manner that will make them accessible at the Project site to governmental inspectors and other authorized agencies. All approved drawings shall be wrapped, marked, and delivered to the Owner within 60 days of Substantial Completion.

§ 3.11.3 The Contractor must continuously maintain at the Project site all material safety data sheets, safety records, daily logs, and other Contract documentation necessary to immediately ascertain the safety of the Work and to establish compliance with life safety policies, hazardous materials requirements, and the Contract Documents.

§ 3.11.4 The Contractor, with its Subcontractors, will prepare draft record Contract Documents, showing all as-built conditions as required under Section 3.11.1, and submit them to Architect for review. Based on Architect's review and comments, if any, Contractor will prepare and deliver to Owner within 60 days of Substantial Completion, final, accurate, and complete record Contract Documents, including without limitation record Drawings and Specifications, showing the exact "as-built" conditions of the Work.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

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§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence in order to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, to the extent that the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

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§ 3.13 USE OF SITE

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.13.2 Prior to commencement of the Work, the Contractor shall review the Project site with the Owner in detail and identify the area of the Work, staging areas, connections or interfaces with existing structures and operations, and restrictions on the Project site area. The Contractor will ensure that all forces on the Project site are instructed about the acceptable working and staging areas and restrictions on use of the site. The Contractor, with advance consent of the Owner, will erect such barriers, signage, and devices as are necessary to restrict access to the Project site to approved personnel and to prevent unauthorized access by construction personnel to non-Work areas.

§ 3.13.3 The Contractor and its Subcontractors shall receive prior approval from the Owner before delivering or storing any materials or tools on the Owner's premises. Upon approval, materials and tools will be stored so that they do not hamper the operation of equipment or persons and do not present a fire or safety hazard.

§ 3.13.4 Contractor and its Subcontractors shall not erect on the Project site any signage intended to advertise or promote their business without the prior written consent of the Owner.

§ 3.13.5 If the Contractor removes the Owner's property, fixtures, materials, or other equipment to perform the Work, the Contractor shall be responsible for the safekeeping of all such property, fixtures, materials, or other equipment including without limitation assuring that such items are not lost, damaged, destroyed, and are upon the Owner's directive are either returned to their original location, reinstalled, replaced, or repaired as necessary.

§ 3.13.6 When all or a portion of the Work is suspended for any reason, the Contractor shall securely fasten down all coverings and protect the Work, as necessary, from damage by any cause.

§ 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

§ 3.15 CLEANING UP

§ 3.15.1 The Contractor shall, each work day, keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract.
§ 3.15.2 At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.3 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 ACCESS TO WORK

§ 3.16,1 The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

§ 3.16.2 Keys. The Contractor will be responsible for all keys issued to it or its Subcontractors for mechanical or other locked rooms. Keys will be obtained from the Owner and may not be copied, transferred, or used for any purpose other than prosecution of the Work. All keys will be returned to the Owner at the conclusion of the Work and as a condition precedent to final payment of the Contractor. If all keys are not returned and the Owner

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determines, in its reasonable discretion, to rekey affected locks, the Contractor will pay the cost of rekeying all affected locks. This remedy is not exclusive of any other remedy of the Owner. The term "key" includes any device used to secure a room or areas in the Owner's premises, whether by mechanical, electronic, or other means.

§ 3.16.3 Identification. The Architect and its Consultants, the Contractor and its Subcontractors, and the employees and agents of any of them shall comply with the Owner's policies and requirements, if any, to obtain, display, and return identification badges at any time while they are present on the Owner's property.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Owner and the Architect.

§ 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify, defend, and hold harmless the Owner and its agents, volunteers, representatives, students, and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' and experts' fees, arising out of or resulting from performance of the Work by the Contractor, a Subcontractor (of any tier), or anyone for whose acts they may be liable:

.1 For death, personal injury (including without limitation sickness, disease, or bodily injury), or property damage to the extent caused by (a) the material breach of these General Conditions or the Contract Documents; (b) violation of laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities; or (c) any negligent or tortious acts or omissions of the Contractor, a Subcontractor (of any tier), or anyone for whose acts they may be liable; and

.2 For claims for any violation of federal, state, or local laws or regulations relating to labor or employment, including without limitation wage-and-hour or benefit claims, asserted by or on behalf of an employee or employees of the Contractor, a Subcontractor (of any tier), or anyone for whose acts they may be liable.

Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

§ 3.18.3 Notwithstanding anything to the contrary in this Section 3.18, the Contractor is not required to indemnify the Owner or its agents and their respective volunteers, representatives, students, and employees for, from, and against liability for damage arising out of death or bodily injury to persons or damage to property caused in whole or in part by the negligence or willful misconduct of the Owner or its agents or their respective employees, but the Contractor is required to indemnify the Owner and its agents and their respective employees for, from, and against liability for damage arising out of death or bodily injury to persons or damage to property to the extent that the death or bodily injury to persons or damage to property arises out of the fault of the Contractor, or the fault of the Contractor's agents, representatives, or Subcontractors. The obligations of the Contractor under this Paragraph 3.18 shall not extend to the liability of the Architect, the Architect's consultants, and agents and employees of any of them arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Architect, the

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Architect's consultants, and agents and employees of any of them provided that such giving or failure to give is the Architect's responsibility and the primary cause of the injury or damage.

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

§ 4.1.1 The Architect is the person lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Architect is terminated, the Owner may employ a successor architect as whom the Contractor has no reasonable objection. The Owner shall consider any reasonable objections of the Contractor, but the choice of the successor architect will solely that of the Owner.

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate For Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, (1) to become familiar with the progress and quality of the portion of the Work completed, (2) to guard the Owner against defects and deficiencies in the Work, and (3) to determine if the Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) deviations and substitutions from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner. All communications involving a change in the cost of the Work must be copied to the Owner. Notwithstanding the above, the Owner may communicate directly with the Contractor.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work and documentation that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith

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either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work. The Architect shall inform the Owner contemporaneously with any rejection of Work or documentation.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, in a manner not to cause delay in the Work while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10 and Section 3.5; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 [Deleted] The Owner shall discuss matters related to the aesthetic intent and effect with the Architect and Contractor. The Architect may propose a solution, but the final decision shall be that of the Owner.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise in a manner not to cause delay in the Work. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

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§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner and the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Owner or the Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect or the Owner requires additional time for review. Failure of the Owner or Architect to reply within the 14 day period shall constitute notice of no reasonable objection. Failure of the Owner to object to a Subcontractor does not imply approval of specific products or materials.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 Subcontractors shall be selected as provided in the Contract and the Guaranteed Maximum Price Amendment.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS

By appropriate written agreement, the Contractor shall require each subcontractor (a) to the extent of the Work to be performed by the subcontractor, to be bound to the Contractor by the scope of Work and requirements of the Contract Documents; (b) to assume toward the Contractor all duties, obligations, and conditions imposed by the terms and conditions of the Contract Documents that the Contractor assumes toward the Owner; and (c) to affirm the same representations to the Contractor that the Contractor makes to the Owner. The Contractor shall require each subcontractor to enter into similar agreements with sub-subcontractors of every tier. The Contractor shall make available to each proposed subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the subcontractor will be bound.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 or stoppage of the Work by the Owner pursuant to Section 2.3.1; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

§ 5.5 DESIGN-BUILD SUBCONTRACTORS

The Contractor may retain various Subcontractors to perform design-build portions of the Project ("Design-Build Subcontractors"), which the Contractor shall identify in advance to the Owner before design-build

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work commences. The Contractor assumes the obligation, as a contractual duty to the Owner, to deliver a completed and functioning Project in accordance with the Contract Documents, including without limitation all designs provided by the Design-Build Subcontractors. The Contractor is not itself a designer and does not independently approve the details of the designs of Design-Build Subcontractors. The Contractor shall place in its subcontracts with each of its Design-Build Subcontractors the following terms and conditions:

.1 The Owner is an intended third-party beneficiary of the design-build subcontract and the Design-Build Subcontractor's services and Work. The Design-Build Subcontractor is not a third-party beneficiary of the Contract or any other agreement between the Contractor and the Owner, or between the Owner and the Architect or the Architect's consultants.

.2 The Design-Build Subcontractor shall maintain through the Project, and for six (6) years after Substantial Completion of the Project, standard professional liability/errors-and-omissions insurance that is (a) in a form and with an insurance company satisfactory to the Contractor and the Owner, and (b) in compliance with the minimum insurance coverage requirements in Article 11 of these General Conditions.

.3 The Design-Build Subcontractor's professional errors and omissions insurance will have the terms and limits as required in Section 11.1 of these General Conditions or as agreed in advance by the Owner and the Contractor.

.4 The Design-Build Subcontractor shall notify the Contractor and the Owner no less than thirty (30) days before any cancellation, nonrenewal, or material modification of the professional errors and omissions insurance.

.5 The Design-Build Subcontractor shall submit to the Owner and the Contractor proof of all such insurance before commencing Work on the Project.

The Contractor shall also ensure that the design-build subcontracts contain no limitation-of-liability clauses.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract.

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§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect and the Owner apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor to so report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except for defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for unavoidable costs the Contractor incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction. All construction costs resulting from Contractor's negligence, lack of oversight, inattention to detail, failure to investigate or failure to follow the Construction Documents or Contract Documents will be borne by the Contractor, subject to the terms and conditions of the Contract Documents and the Guaranteed Maximum Price Amendment.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor causes to completed or partially completed construction or to property of the Owner, separate contractors as provided in Section 10.2.5. If a separate contractor initiates legal or any other proceedings against the Owner on account of any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor, who shall defend such proceedings and indemnify the Owner against any judgment or award, including without limitation costs and attorney fees. This Section 6.2.4 does not require the Contractor to indemnify the Owner against liability for damage arising out of death or bodily injury to persons or damage to property to the extent that the liability was caused by the negligence or intentional misconduct of the Owner.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors and the Owner about the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order or Construction Change Directive, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order or Construction Change Directive.

§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

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§ 7.2.2 Before approval of a Change Order and upon request of the Architect or the Owner, the Contractor will produce copies of all bids or other proposals, including those from Subcontractors and Sub-subcontractors, related to the Work proposed to be performed pursuant to the Change Order.

§ 7.2.3 Agreement on any Change Order shall constitute a final settlement of all matters relating to the changes in the Work that is the subject of the Change Order, including without limitation all direct and indirect costs associated with such change and any and all adjustments to the Contract Sum and the construction schedule.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order normally prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive may be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- **.1** Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- **.2** Unit prices stated in the Contract Documents or subsequently agreed upon;
- **.3** Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- **.4** As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect and Owner of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Owner and the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in Section 7.5 of these General Conditions. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Owner and the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, reasonable expenditures for the purposes of this Section 7.3.7 shall be limited to the following:

- **.1** Costs of labor, including social security, unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
- **.2** Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
- **.3** Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

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.4 permit fees, taxes, and increased costs of bonds and insurance (if such increases are necessitated by the Construction Change Directive related to the Work; and

.5 Additional costs of supervision and field office personnel directly attributable to the change.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Owner and the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor will submit to Owner for approval a not-to-exceed price for performance of the Work required by the Construction Change Directive. The Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment, but the Owner is not obligated to make payments for Work completed under the Construction Change Directive until the parties agree on a not-to-exceed price. If the parties do not agree on a not-to-exceed price within 30 days after the Owner's issuance of the Construction Change Directive to the Contractor, then the Owner will make an interim determination on the amount owed to the Contractor for Work completed under the Construction Change Directive. The Owner's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 MINOR CHANGES IN THE WORK

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. After the Architect communicates to the Owner that a minor change has been made, the change will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

§ 7.5 AGREED OVERHEAD AND PROFIT RATES

§ 7.5.1 For any adjustments to the Guaranteed Maximum Price that are based on other than the unit prices method, the Contractor will charge, and accept, as payment for overhead and profit, the following percentages of costs attributable to the change in the Work. The following overhead and profit rates shall also apply to adjustments to subcontracts that do not adjust the Guaranteed Maximum Price.

.1 For work performed by the Construction Manager's own forces, the following markups shall apply:

Job Services for incidental pick up Work (by Hoffman Structures): For all job services related to incidental pick up Work performed by Hoffman Structures, Construction Manager will apply (i) an administrative fee equal to 3% of the actual costs for labor, labor burden, taxes, and fringes and (ii) a Construction Manager's fee, equaling 3.1% of the actual costs for labor, labor burden, taxes, and fringes.

Survey Services (by Ming Surveying): For all surveying services performed by Ming Surveying, Construction Manager will apply a Construction Manager's fee equaling 3.1% of the surveying costs. Construction Manager will bill surveying costs to Owner at a total rate of $230 per hour through the end of the 2018 calendar year. The rate will be adjusted annually thereafter in accordance with the Consumer Price Index, subject to Owner's prior written approval. Construction Manager will also verify that Ming Survey's rate meets local market costs prior to commencing Work.

Hoffman Equipment Yard Rental: For equipment owned by Construction Manager or Affiliated Entities, Construction Manager will apply markup equaling 10% of the rental equipment cost. But the sum of (a) the rental equipment cost and (b) markup referenced in this paragraph may not exceed 75% of market rental rates. Construction Manager may, however, apply the Construction Manager's Fee to the rental equipment cost and markup even if application of the Construction Manager's Fee causes the total cost to exceed 75% of market rental rates.

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Third Party Equipment Rentals: For equipment not owned by Construction Manager or Affiliated Entities, Construction Manager will apply (i) a yard overhead cost equaling 7% of the total cost of renting the equipment and (ii) a Construction Manager's fee, equaling 3.1% of the total cost of renting the equipment. The total cost of renting the equipment as referenced in this paragraph equals 100% of the cost incurred by Construction Manager to rent the equipment from the third party.

Permanently Installed Work (by Hoffman Mechanical, Hoffman Structures, etc.): For permanently installed Work that is competitively bid, such as concrete, mechanical or plumbing, Construction Manager will apply a fee equaling 3.1% of the cost of that permanently installed Work.

.2 For Work performed by a Subcontractor, the Contractor may claim no more than the percentage applied to calculate the Contractor's Fee or five percent (5.0%) of the actual amount due to the Subcontractor for the Cost of the Work, whichever is less.

.3 For Work performed by a Subcontractor or Sub-subcontractor, the Subcontractor or Sub-subcontractor may claim no more than ten percent (10.0%) of its actual Cost of the additional Work.

.4 For Work performed by a Sub-subcontractor, its Subcontractor may claim a markup of no more than the percentage applied to calculate the Subcontractor's Fee or ten percent (10.0%) of the amount actually payable to the Sub-subcontractor for the Cost of the Work, whichever is less.

.5 The Costs of the Work to which overhead and profit are to be applied at any tier are determined by Article 6 of the Agreement.

.6 All cost proposals, except those so minor that their propriety can be readily determined, must be accompanied by a complete itemization of costs, including without limitation the costs of labor, materials, subcontracts, and sub-subcontracts. Subcontractor costs exceeding $1,500 must be similarly itemized.

.7 All general conditions or general requirements costs of the Contractor, Affiliated Entities, and all Subcontractors of any tier are not included in the markups listed in Section 7.5.1.1.

.8 The Contractor bears the burden of establishing the reasonableness of any proposed increase in the Contract Sum or Contract Time.

§ 7.5.2 Overhead and profit adjustments for net decreases in the cost of any portion of the Work shall include a deduction of the overhead and profit, fee, and general conditions or general requirements costs that would be allowed for that Work by the terms of Section 7.5.1.

§ 7.5.3 Overtime, when specifically authorized by the Owner and not as an extraordinary measure, shall be paid for by the Owner on the basis of premium payment only, plus the cost of insurance and taxes based on the premium payment period. The Owner will not pay overhead and profit for overtime.

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

§ 8.1.1 The Contract Time is the period of time from the date of commencement to Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 Substantial Completion is defined in Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

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§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time is of the essence of this Contract. Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 Consistent with Section 11.1.10, the date of commencement cannot occur before placement of insurance. The Contractor will not commence Work or enter the Project Site before placement of insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in progress of the Work by an act of negligence of the Owner or the Architect, or of an employee of either involved in the Project, or of a separate contractor employed by the Owner, or by changes ordered in the Work, or by occurrences beyond the control and without the fault or negligence of the Contractor or its Subcontractors and that by the exercise of reasonable diligence the Contractor is unable to prevent or provide against, including industry-wide labor disputes, fire, unusual and extended delays in deliveries, unavoidable casualties, adverse weather conditions not reasonably anticipated, or other occurrences that the Owner determines may justify delay, then the Contractor may obtain an extension of the Contract Time and adjustment to Contract Sum only upon satisfying the prerequisite conditions of (a) compliance with Subparagraph 15.1.3 of the General Conditions and (b) presentation to the Owner and the Architect of written notice of the request for an extension of the Contract Time as provided in Subparagraph 15.1.5.1. The Contract Time and Contract Sum may under these circumstances be adjusted by Change Order for the additional time actually and directly caused by the unforeseen occurrence. The extension will be net of any delays caused by or due to the fault or negligence of the Contractor and will also be net of any contingency or "float" time allowance included in the Project Schedule. In the event delays in the Work are encountered for any reason, the Owner and Contractor shall undertake reasonable steps to mitigate the effect of such delay.

§ 8.3.2 The Contract Time is set with reference to and knowledge of weather conditions usual to the area of the Project. To justify an excused delay in the Contract Time, adverse weather conditions not reasonably anticipated for purposes of Subparagraph 8.3.1 require the presence of abnormally severe or unsafe working conditions on the site that have a material, adverse effect on the scheduled Critical Path Work activities. As a minimum condition for a claim for additional time for abnormally severe weather, the Contractor must provide documentation from National Oceanic and Atmospheric Administration, or other comparable weather agency, that the conditions as the basis for the claim are more severe than for any comparable time period in the vicinity of the site within the past ten years.

§ 8.3.3 If the delay was caused by any public entity other than the Owner and not caused by the Owner, the Contractor, a Subcontractor of any tier, the Architect, or anyone acting on behalf of one or more of them, the Contractor is entitled only to an increase in the Contract Time (but not a change in the Contract Sum). If the delay was caused by the Contractor, a Subcontractor of any tier, or anyone acting on behalf of one or more of them, the Contractor is not entitled to an increase in the Contract Time or Contract Sum.

§ 8.3.4 [Deleted].

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. The Owner will make progress payments to the Contractor no more than once each month based on a verified Application for Payment submitted by the Contractor and signed by the Owner.

§ 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect and the Owner, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect and the Owner may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

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§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2., for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.1.4 The Contractor shall submit its monthly Application for Payment to the Owner and the Architect (if required by the Owner), on AIA Document G702, supported by AIA Document G703, or an equivalent form approved by the Owner. Each Application for Payment shall be accompanied by the following, all in form and substance satisfactory to the Owner:

.1 Description of the Work.

.2 Detailed cost report and updated schedule of values.

.3 Separate documentation and accounting for Work performed pursuant to Change Orders, Construction Change Directives, or minor changes in the Work; allowances; application of contingency; and payment for materials stored other than at the Project Site.

.4 The Contractor's executed lien, bond, and claim releases ("Lien Releases") on forms acceptable to the Owner. Lien Releases shall provide a conditional release of liens, bonds, and claims for the Work that is subject to the current Application for Payment and an unconditional release for all Work performed through the date of all prior payment periods.

.5 All other information and materials required to comply with the requirements of the Contract Documents.

The Owner may, at its option, request documentation from the Contractor evidencing that Subcontractors, Sub-subcontractors, and suppliers of every tier have provided the requisite conditional and unconditional releases and waivers of lien and bond rights to the Contractor for each Application of Payment.

§ 9.3.2 Unless otherwise expressly provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the Project site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which payments have previously been received from the Owner shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

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§ 9.3.4 Retainage will be withheld at a rate of five percent (5%) in accordance with ORS 279C.570.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor or Subcontractor to make payments to Subcontractors or Sub-subcontractors or for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner or a separate contractor;
- **.6** reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- **.7** failure to carry out the Work in accordance with the Contract Documents;
- **.8** unsatisfactory Work progress;
- **.9** disputed Work, materials, or products, not to exceed one hundred fifty percent (150%) of the amount in dispute;
- **.10** failure to comply with other material provisions of the Contract Documents;
- **.11** failure to maintain current safety and as-built documents as required by Section 3.11; or
- **.12** failure to train personnel on the Project site in required safety procedures as required in the Contract Documents.

§ 9.5.2 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect. The Owner will notify the Contractor of a joint payment, and the Owner will receive credit against the Contract Sum for the joint payment.

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§ 9.5.4 If the Contractor disputes any determination by the Architect with regard to any Certificate of Payment, the Contractor nevertheless shall expeditiously continue the Work.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

§ 9.7.1 If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.7.2 Failure of payment does not exist under Section 9.7.1 if the Owner exercises authority granted by the Contract documents to withhold payment notwithstanding certification by the Architect.

§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when (1) the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use and (2) the Contractor, its Subcontractors of any tier, and its suppliers of any tier have completed or satisfied all conditions required of the Contractor for the issuance of a temporary or permanent certificate of occupancy.

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.1 As part of the final Application for Payment, the Contractor shall assemble for the Architect's approval within thirty (30) days of Substantial Completion three (3) complete bound copies of all operation, maintenance, and warranty data from all manufacturers whose equipment is installed in the Work. The final Certificate for Payment will not be issued by the Architect until all warranties and guaranties have been received and accepted by the Owner.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Owner or the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Owner or the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Owner's or Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Owner or the Architect. In such case, the Contractor shall then submit a request for another inspection by the Owner or the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list prepared under this Section 9.8. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Owner and the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.9.4 The Contractor shall deliver to the Owner certificates of inspection, use, and occupancy upon completion of the Work in sufficient time for occupation of the Project in accordance with the approved schedule for the Work. The costs of such procurement, payment, and delivery shall be included within the Contract Sum.

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§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Owner and the Architect will promptly make such inspection and, when the Owner and the Architect find the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 In the event that final completion is not accomplished within 30 days after the date of Substantial Completion due to any fault of the Contractor, the Owner may withhold from any subsequent progress payments and from the final payment 150 percent of the reasonable cost of the unfinished Work necessary to attain final completion. Such funds are to be paid pro rata following successful completion of the unfinished Work if the Work is done by the Contractor. In the event that the Contractor fails to complete the Work necessary to attain final completion, the Owner may, without waiving any other remedies it may have, complete the Work and deduct the actual cost thereof from the funds withheld. The Owner shall not withhold any amount under this section relating to Work arising from Change Orders or Construction Change Directives issued following the date of Substantial Completion.

§ 9.10.5 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents;
- **.3** terms of warranties required by or included in the Contract Documents; or
- **.4** the correction remedy allowed by Section 12.2.

§ 9.10.6 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

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§ 9.10.7 Requests for payment will not be considered if submitted (1) more than ninety (90) days following completion of the Work performed or (2) on or after the date of acceptance of final payment, whichever is **earlier.**

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

§ 10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor acknowledges the unique safety risks associated with construction of school facilities in the presence of faculty, students, staff, and visitors.

§ 10.1.2 This Contract incorporates by this reference any Owner's safety policies current as of the date of commencement of the Work, which have been or will be made available to the Contractor. The Contractor, as a condition precedent to commencement of the Work, will instruct all personnel of the Contractor and its Subcontractors, prior to their performing any of the Work, of the elements of these policies with which the personnel will be required to comply. Notwithstanding any other provision of the Contract Documents, the Contractor's (or any Subcontractor's) failure to perform adequate safety training is grounds for the Owner's immediate suspension of the Work at the Contractor's sole expense and may result in cancellation of the Contract.

§ 10.1.3 In addition to the policies identified above, the Contractor shall review with all Subcontractors the methods, materials, tools, and equipment to be used to verify their compliance with all safety standards and laws and the Contractor shall be responsible for compliance with them, to ensure safe, hazard-free conditions for all persons visiting or working on the entire Project site and the Owner's adjoining facilities.

§ 10.1.4 The Contractor will develop a fire response plan consistent with that of the Owner, which will be strictly enforced by the Contractor's project safety officer and the Owner. The Contractor will supply fire extinguishers in sufficient size and quantity, distributed throughout the Project site, to maintain a safe working environment.

§ 10.1.5 The Contractor will ensure that all equipment furnished and installed as part of the Work is rated by Underwriters Laboratories or another method approved by the state testing laboratory or the Owner, as appropriate.

§ 10.1.6 Tobacco use is not permitted on any of the Owner's property. The Contractor will publish this standard to all personnel for whom it or its Subcontractors are responsible and will enforce it appropriately.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take all necessary reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

- **.1** employees on the Work, the Owner's faculty, staff, students, and visitors and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors;
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction; and
- **.4** adjoining operations of the Owner.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including installing fencing and posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities. The Contractor shall also be responsible, subject to the terms of the Contract, for all measures necessary to protect any property adjacent to the Project and improvements therein. Any damage to such property or improvements shall be promptly repaired by the Contractor. Contractor shall provide reasonable fall protection safeguards and provide approved fall protection safety equipment for use by all exposed Contractor employees.

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§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel. The Contractor must obtain advance approval before proceeding with the storage or use of explosives or hazardous materials for performance of the Work.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 through 10.2.143 to the extent caused by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 through 10.2.1.4, but not to the extent of damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent or designated safety officer unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition. The Contractor will ensure that storage practices on the Project site will keep combustible load levels at a minimum and in approved containers that are clearly labeled. The Contractor will provide material safety data sheets to the Owner's Representative for all chemicals used on the Project site.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

The Contractor will immediately report to the Owner by telephone or messenger whenever any person at the Project Site suffers injury or if there is property damage to the Owner's existing facilities or adjoining property. The notice shall provide sufficient detail to enable the other party to investigate the matter. The Contractor will promptly follow up the notice with a written report to the Owner.

§ 10.2.9 Without limiting any other requirement of this Section 10.2, the Contractor shall protect adjoining property and shall provide barricades, temporary fences, and covered walkways to protect the safety of passersby, as required by prudent construction practices, laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, or the Contract Documents. The Contractor shall be responsible for all measures necessary to protect any property adjacent to the Project and improvements thereon.

§ 10.2.10 Without limiting any other requirement of this Section 10.2, the Contractor shall, at its sole cost and expense, promptly repair any damage or disturbance to walls, utilities, sidewalks, curbs, adjoining property, and the property of third parties (including utility companies and governments) resulting from the performance of the Work, whether caused by the Contractor or by its Subcontractors of any tier. The Contractor shall maintain streets in good repair and traversable condition.

§ 10.2.11 The Contractor will ensure that storage practices on the Project site will keep combustible load levels to a minimum and in approved containers that are clearly labeled. The Contractor will provide material safety data sheets to the Owner for all chemicals used on the Project Site.

§ 10.2.12 Without limiting any other requirement of this Section 10.2, the Contractor shall maintain Work, materials, and apparatus free from damage from rain, wind, storms, frost, and heat. If adverse weather makes it impossible to continue operations safely in spite of weather precautions, the Contractor shall cease Work and notify the Owner and the Architect of the cessation.

§ 10.2.13 The Contractor shall not permit open fires on the Project Site.

§ 10.3 HAZARDOUS MATERIALS

§ 10.3.1 Hazardous Materials as that term is defined under Section 10.3.6. With respect to Hazardous Materials to be used during the course of the Work, the Contractor will implement and enforce a program to inventory and properly store and secure all Hazardous Materials that may be used or present on the Project site, maintain available for inspection at the Project site all material safety data sheets, and comply with all regulations required by law for the

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storage, use, and disposal of Hazardous Materials. The program must provide for notification of all personnel of potential chemical hazards. Review of these hazards must be included in the Contractor's safety training program. The Contractor shall submit to the Owner a list of all Hazardous Materials to be brought by the Contractor or its Subcontractors onto the Owner's property, including the purpose for their use on the Project.

§ 10.3.2 In the event of a release or discovery of a preexisting release of Hazardous Materials, or if it is foreseeable that injury or death to persons may occur because of any material or substance (including without limitation Hazardous Materials) encountered on the Project site , the Contractor shall promptly (1) stop the Work or the portion of the Work affected, (2) notify the Owner and the Architect orally and in writing, and (3) protect against exposure of persons to the Hazardous Materials. The Contractor shall provide all written warnings, notices, reports, or postings required at law or by contract for the existence, use, release, or discovery of Hazardous Materials.

§ 10.3.3 With respect to any Hazardous Materials or other material or substance reported to the Owner under Section 10.3.2 that was not introduced to the Project site by the Contractor or its Subcontractors of any tier, the Owner shall obtain the services of a qualified environmental consultant to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to verify it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time may, subject to agreement by the Owner and the Contractor, be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up, which adjustments shall be accomplished as provided in Article 7.

§ 10.3.3.1 With respect to any Hazardous Materials or other material or substance reported to the Owner under Section 10.3.2 that was introduced to the Project site by the Contractor or its Subcontractors of any tier, the Contractor shall be responsible to carry out the duties of (1) proposing to the Owner and the Architect a qualified environmental consultant, (2) obtaining and paying for the services of the environmental consultant, and (3) verifying that the material is rendered harmless, as otherwise set forth in Section 10.3.3. The Contractor will not be entitled to an increase in the Contract Sum as stated in the last sentence of Section 10.3.3 if the Contractor or its Subcontractors of any tier are responsible for the condition requiring the testing of the material and the stoppage of the Work. Remediation work must be conducted by properly qualified contractors approved in advance by the Owner. Generally, the Owner may at its option contract directly with environmental consultants, and remediation contractors, regardless of whether the work will be performed at the Contractor's expense.

§ 10.3.4 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including without limitation attorney fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance was not introduced to the Project site by the Contractor or its Subcontractors of any tier, presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless.

No indemnification provided by the Owner under this Section 10.3.4 will be required to indemnify the Contractor, Subcontractors, or their employees or agents to the extent of
liability for death or bodily injury to persons or damage to property caused in whole or in part by the Contractor's own negligence, but will require indemnity to the extent of the fault of the Owner or its agents or representatives.

§ 10.3.5 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, the Owner's Representatives, and employees of any of them from and against claims, damages, losses, and expenses, including without limitation to attorney fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance was introduced to the Project site by the Contractor or its Subcontractors of any tier, presents the risk of bodily injury or death, and has not been rendered harmless. No indemnification provided by the Contractor under this Section 10.3.5 will be required to indemnify the Owner or its

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agents or representatives to the extent of liability for death or bodily injury to persons or damage to property caused in whole or in part by the Owner's own negligence, but will require indemnity to the extent of the fault of the Owner or its agents or representatives.

§ 10.3.6 "Hazardous Materials" are any substance defined or designated as being radioactive, infectious, hazardous, dangerous, or toxic by any federal, state, or local statute, regulation, or ordinance presently in effect or subsequently enacted. For purposes of Section 10.3, the term "introduce" means the physical placement or transportation of Hazardous Materials in or on the Project site regardless of whether the Hazardous Material was specified, required, or otherwise addressed in the Contract Documents.

§ 10.4 EMERGENCIES

In an emergency affecting safety of persons or property, the Contractor shall act to prevent threatened damage, injury or loss and immediately notify the Owner. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- **.1** Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
- **.2** Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- **.3** Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- **.4** Claims for damages insured by usual personal injury liability coverage and commercial general liability coverage (or its equivalent as approved in advance by the Owner);
- **.5** Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- **.6** Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
- **.7** Claims for bodily injury or property damage arising out of completed operations;
- **.8** Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18;
- **.9** claims for third-party injury and property damage (including without limitation clean-up costs) as a result of pollution conditions arising from the Contractor's operations or completed operations; and
- **.10** claims involving the Contractor's professional liability, solely to the extent that the Contractor accepts design or design/build responsibilities under this Contract.

Contractor with prior approval from the Owner, may provide a Contractor Controlled Insurance Program (CCIP), which will include commercial general liability and excess liability and employers liability for the benefit of the Owner and all additional insureds required by Owner, however, nothing herein shall obligate Contractor to provide professional liability coverage under the CCIP or to provide coverage to the Owner, additional insureds, A/E, its subconsultants, or enrolled subcontractors of every tier who perform the Work at or from the designated Project site for claims arising from the design of the project which coverages are expressly excluded from the CCIP policies.

§ 11.1.2 CONTRACTOR PROVIDING INSURANCE

Without waiver of any other requirement of Section 11.1, the Contractor will pay for and maintain the following insurance at all times during the performance of the Work, without interruption until final acceptance of the Work or for such further duration as required below. All of the Contractor's insurance carriers shall be rated A VII or better by A.M. Best's rating service, unless otherwise approved by the Owner.

.1 Workers' Compensation. The Contractor shall purchase and maintain workers' compensation coverage

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sufficient to meet statutory liability limits.

.2 **Employer's Liability.** The Contractor shall purchase and maintain employer's liability insurance in addition to its workers' compensation coverage with at least the minimum limits listed in Section 11.1.3 of these General Conditions.

.3 **Commercial General Liability.** The Contractor shall purchase and maintain commercial general liability ("CGL") insurance on an occurrence basis, written on ISO Form CG 00 01 (12 04 or later) or an equivalent form approved in advance by the Owner. CGL coverage shall include all major coverage categories, including bodily injury, property damage, and products/completed operations coverage maintained for at least six (6) years following Final Payment. The CGL insurance must also include the following: (1) separation of insureds and (2) per-project aggregate.

.4 **Professional Liability.** To the extent that the Contract Documents require the Contractor to provide professional design services or certifications related to systems, materials, or equipment, the Contractor shall (1) purchase and maintain professional liability/errors-and-omissions insurance and (2) cause those Subcontractors providing professional design services or certifications related to systems, materials, or equipment to do so under the requirements of Sections 5.5 and 11.1.3.

.5 **Automobile Liability.** The Contractor shall purchase and maintain automobile liability insurance with coverage for owned, hired, and nonowned vehicles on ISO Form CA 00 01 or an equivalent form approved in advance by the Owner. The automobile liability insurance shall include pollution liability coverage with vehicle overturn and collision.

.6 **Pollution Liability.** If the Owner designates the Project as having a known pollution exposure, the Contractor shall purchase Contractors Pollution Liability ("CPL") insurance. If the CPL insurance is written on a claims-made basis rather than an occurrence basis, then coverage must be maintained for at least six (6) years following final payment. Coverage is to include third-party claims for bodily injury, property damage, and environmental damage resulting from pollution conditions caused during the performance of covered operations both on site and migrating from the jobsite. Coverage is also to include pollution conditions arising from covered operations, including work performed by the Contractor's Subcontractors and third-party claims against the Contractor alleging improper supervision of the Subcontractors. The Contractor shall arrange for, and be responsible for, the selection of Subcontractors used to transport all Hazardous Materials that leave the Project site.

.7 **Commercial Umbrella/Excess Coverage.** The Contractor shall purchase or maintain commercial umbrella or excess liability insurance to meet the minimum limits as described below in Section 11.1.3. Commercial umbrella/excess liability coverage includes: (1) "Pay on behalf of" wording; (2) concurrency of effective dates with primary coverage; (3) punitive damages coverage (if not prohibited by law); (4) application of aggregate (when applicable) in primary coverage; and (5) drop-down feature. The third-party liability insurance shall be scheduled to the umbrella/excess coverage.

§ 11.1.3 Limits. The insurance required by Section 11.1 shall be written for at least the limits of liability specified in this Section or required by law, whichever is greatest.

.1 **Workers' Compensation.** Statutory Limits

.2 **Employer's Liability.**

Each Accident: $ 1,000,000
Each Bodily Injury Disease: $ 1,000,000
Aggregate Bodily Injury Disease: $ 1,000,000

.3 **Commercial General Liability.**

Each Occurrence: $ 2,000,000
General Aggregate: $ 3,000,000
Product/Completed Operations: $ 3,000,000
Personal & Advertising Injury: $ 2,000,000

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.4 **Professional Liability/E&O.**
Each Claim/Aggregate: $ 2,000,000

.5 **Automobile Liability.**
Combined Single Limit: $ 1,000,000

.6 **Pollution Liability.**
Single Limit: $ 50,000,000
Aggregate: $ 50,000,000

.7 **Commercial Umbrella/Excess Coverage.**
Each Occurrence: $ 20,000,000

§ 11.1.4 Additional Insureds. The Contractor's third-party liability insurance policies shall include the Owner and its officers, employees, agents, volunteers, partners, successors, and assigns as additional insureds. The policy endorsement must extend premise operations and products/completed operations to the additional insureds. The additional insured endorsement for the Commercial General Liability must be written on ISO Form CG 2010 (11/85), a CG 2037 (07/04) together with CG 2033 (07/04), or the equivalent; but shall not use the following forms: CG 20 10 (10 93) or CG 20 10 (03 94).

§ 11.1.5 Joint Venture. If the Contractor is a joint venture, the joint venture shall be a *named* insured for the liability insurance policies.

§ 11.1.6 Primary Coverage. The Contractor's insurance identified in Section 11.1 shall be primary insurance coverage and may not seek contribution from any insurance or self-insurance carried by the Owner including any property damage coverage carried by the Owner. Contractor's insurance shall apply separately to each insured against whom a claim is made or suit is brought. The Contractor's insurance shall not include any cross-suit exclusion or preclude an additional insured party from asserting a claim as a third party. The Contractor waives all rights of subrogation against the Owner and coverage that the Owner maintains.

§ 11.1.7 Contractor's Failure to Maintain Insurance. If the Contractor for any reason fails to maintain required insurance coverage, such failure shall be deemed a material breach of the Contract and the Owner, at its sole discretion, may suspend or terminate the Contract pursuant to Section 14.2. The Owner may, but has no obligation to, purchase such required insurance and without further notice to the Contractor, the Owner may deduct from the Contract Sum any premium costs advanced by the Owner for such insurance. Failure to maintain the insurance coverage required by this Section 11.1 shall not waive the Contractor's obligations to the Owner.

.1 The Contractor shall notify the Owner in writing at least thirty (30) days before any cancellation, lapse, or expiration of any insurance required by this Article 11.

.2 The Contractor shall notify the Owner in writing of any reduction in available insurance coverage, including without limitation revised coverage limits or claims paid under the general aggregate, or both, that would cause the insurance available to the Owner to fall below or outside the requirements set forth in this Article 11 or by law.

§ 11.1.8 Certificates of Insurance. Before commencing the Work, the Contractor shall supply to the Owner certificates of insurance for the insurance policies described in this Section 11.1 prior to the commencement of the Work and before bringing any equipment or construction personnel onto the Project site.

.1 **Additional Certificates.** To the extent that the Contractor's insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment as required by Section 9.10.2. Information concerning reduction of coverage on account of revised limits or claims paid under the general aggregate, or both, shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

.2 **Prohibition Until Certificates Received.** The Owner may, but is not obligated to, prohibit the Contractor and its Subcontractors from entering the Project site until the required insurance

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certificates and all required attachments have been received and approved by the Owner. The Contractor may not enter the Project site or commence the Work until the Contractor places for the Work all coverages required under Section 11.1.2.

§ 11.1.9 Subcontractor Insurance. The Contractor shall cause each Subcontractor to purchase and maintain in full force and effect policies of insurance as specified in this Section 11.1, except for coverage limits, which will be agreed upon between the Owner and the Contractor. The Contractor will be responsible for the Subcontractors' coverage if the Subcontractors fail to purchase and maintain the required insurance. When requested by the Owner, the Contractor will furnish copies of certificates of insurance establishing coverage for each Subcontractor.

§ 11.1.10 Limitations on Coverage.

.1 No insurance provided by the Contractor under this Section 11.1 will be required to indemnify the Owner, the Architect, or their employees or agents to the extent of liability for death or bodily injury to persons or damage to property caused in whole or in part by their own negligence, but will require indemnity to the extent of the fault of the Contractor or its agents, representatives, or Subcontractors.

.2 The obligations of the Contractor under this Section 11.1 shall not extend to the liability of the Architect or its consultants for (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs, or specifications, or (2) the giving or failure to give directions or instructions, to the extent that the directions, or failure to provide directions, are the cause of the injury or damage.

.3 **By requiring insurance, the Owner does not represent that coverage and limits will necessarily be adequate to protect the Contractor. Insurance in effect or procured by the Contractor will not reduce or limit the Contractor's contractual obligations to indemnify and defend the Owner for claims or suits that result from or are connected with the performance of the Contract.**

§ 11.1.11 DEDUCTIBLES/SELF-INSURED RETENTIONS Payment of deductibles or self-insured retentions is not a Cost of the Work within the Contract Sum or the Guaranteed Maximum Price and does not justify a Change Order. **Satisfaction of all self-insured retentions or deductibles is the sole responsibility of the Contractor.**

§ 11.2 OWNER'S LIABILITY INSURANCE

The Owner shall be responsible for maintaining the Owner's usual liability insurance.

§ 11.3 PROPERTY INSURANCE

§ 11.3.1 Unless otherwise provided, the Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earth movement, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by

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enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's, Owner's, and Contractor's services and expenses required as a result of such insured loss.

§ 11.3.1.2

§ 11.3.1.3 If the property insurance requires deductibles, the Contractor shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 BOILER AND MACHINERY INSURANCE
The Owner shall maintain boiler and machinery insurance.

§ 11.3.3 [Deleted]

(Paragraph Deleted)

§ 11.3.4 [Deleted]
§ 11.3.5 [Deleted]

§ 11.3.6
[Deleted]
§ 11.3.7 [Deleted]

(Paragraph Deleted)

§ 11.3.8 A loss insured under the Contractor's property insurance shall be adjusted by the Contractor and made payable to the Contractor for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Contractor shall, upon occurrence of an insured loss, give bond for proper performance of the Contractor's duties. The cost of required bonds shall be charged against proceeds received. The Contractor shall deposit in a separate account proceeds so received, which the Contractor shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Contractor shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Contractor's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Contractor shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

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§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Guaranteed Maximum Price Amendment or Early Work Amendment, if any, as required by the Contract.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.4.3 The Contractor may require one or more Subcontractor(s) to furnish payment and performance bonds covering the faithful performance of the particular subcontract, purchase order or similar agreement and the payment of obligations arising there under. In the event such bonds are furnished pursuant to this Subparagraph, the Owner shall pay the Contractor the cost of such bonds as part of the Cost of the Work, subject to the Guaranteed Maximum Price. Upon written approval from the Owner, Contractor may elect to provide Subcontractor default insurance (SDI) in lieu of performance and payment bonds for Subcontractors. Such subcontractor default insurance (SDI) shall provide coverage against losses directly caused by the default of performance or payment of a subcontractor under the terms and conditions of its subcontract. SDI shall be considered as part of the Cost of the Work, subject to the Guaranteed Maximum Price.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Owner's or the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Owner or the Architect, be uncovered for examination by the Owner, the Architect, or any governmental authority and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Owner and the Architect or any governmental authority has not specifically requested to examine prior to its being covered, the Owner or the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of uncovering and correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Owner, the Architect, or any governmental authority or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Owner's and the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly for no additional compensation after notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

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§ 12.2.2.3 The one-year period for correction of Work shall be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor, at its expense, shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located.

§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole or in part without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and

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approvals by public agencies or by independent testing laboratories, as may be required by the Owner or the permitting jurisdiction. The Owner shall retain and pay for any private inspectors or testing laboratories that are required. The costs of such private inspections and tests shall not be included in the Contract Sum. The Contractor shall forward to the Architect and the Owner copies of all inspections, results, test results, orders, permits, and other directives or correspondence received by the Contractor from any inspector, testing laboratory, or agency with jurisdiction over the Work. The Contractor shall give the Owner and the Architect timely notice of when and where tests and inspections are to be made so that the Owner and the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Owner and the Architect of when and where tests and inspections are to be made so that the Owner and the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Owner's and the Architect's services and expenses shall be at the Contractor's expense, including without limitation the cost of retesting for verification of compliance, if necessary, until the Architect certifies that the Work in question does comply with the requirements of the Contract Documents.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5.7 No inspection performed or failed to be performed by the Owner shall waive any of the Contractor's obligations or be construed as an approval or acceptance of the Work or any part thereof.

§ 13.6 INTEREST

Payments due and unpaid under the Contract Documents shall bear interest at an annual rate of one percent (1.0%) over the prime lending rate published by the *Wall Street Journal*.

§ 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether based on contract, tort, breach of warranty, statute, or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;

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.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, (1) repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less, and (2) none of the repeated suspensions, delays, or interruptions of the entire Work are caused by act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or any of their respective agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents; or

.5 fails to observe the training, safety, and other precautions required in Article 10, including the Contractor's own safety policies for the Project.

§ 14.2.2 When any of the above reasons exist, the Owner may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate the Contract and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Owner's and the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner.. This obligation for payment shall survive termination of the Contract.

§ 14.2.5 If termination for cause is determined later to have been wrongful or without justification, then the termination will be considered to have been termination for convenience.

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§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:

.1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of termination for the Owner's convenience, the Contractor shall:

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work executed. The Contractor hereby waives and forfeits all other claims for payment and damages, including without limitation anticipated profits.

§ 14.4.4 The Owner may terminate a portion of the Work for the Owner's convenience and without cause, in which case the provisions of this Section 14.4 shall apply only to the portion of the Work terminated and the Contractor shall continue with performance of the remaining Work that is not terminated.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be made by written notice to the other party and the Architect. Claims by either party must be made within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later, and must identify the known bases for each Claim and the nature and amount of the relief sought.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum or Guaranteed Maximum Price, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4. Failure to provide timely notice in accordance with Section 15.1.2 constitutes waiver of the Claim.

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§ 15.1.5 CLAIMS FOR ADDITIONAL TIME

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary. Claims for additional time are governed by Section 8.3. Failure to provide timely notice in accordance with Section 15.1.2 constitutes waiver of the Claim.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 15.1.6 [Deleted]

(Paragraph Deleted)

§ 15.2 INITIAL RESOLUTION

§ 15.2.1 To facilitate the resolution of Claims between the Contractor and the Owner, the parties shall attempt in good faith first to resolve Claims that are made before Final Payment by the following dispute-resolution process. The parties agree not to proceed to arbitration until the following process has been attempted. Neither party's rights, defenses, Claims, and remedies shall be considered waived, released, or adversely affected by its participation in this process, but this process shall not toll any applicable statutory periods of limitation, duration, or ultimate repose except to the extent that the parties separately agree in writing to toll those periods.

(Paragraph Deleted)

.1 All reasonable efforts will be made by the Owner's Representative and the Contractor's project manager to resolve any Claims that arise during the Work in a prompt and equitable manner. If they fail to reach an equitable agreement to resolve a Claim, either party may notify the other party in writing to identify the Claim with known specificity and request a meeting between the Owner's senior executive responsible for the Project and the Contractor's senior executive responsible for the Project.

.2 The parties' senior executives shall meet at a mutually agreed time and place within ten (10) days of receipt of the written notice and attempt in good faith to negotiate a resolution of the Claim. If within ten (10) days after the meeting the parties have not succeeded in negotiating an agreed-upon resolution of the Claim, then either party may pursue any and all rights and remedies available to it in the Agreement.

.3 The parties may at any time mutually agree to submit any dispute between them to voluntary mediation or to arbitration under Section 15.4.

§ 15.2.2 [Deleted].

§ 15.2.3 [Deleted].

§ 15.2.4 [Deleted].
§ 15.2.5 [Deleted].

§ 15.2.6
[Deleted]
§ 15.2.6.1 [Deleted]

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

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§ 15.2.8 If a Claim relates to or is the subject of a materialman's lien or construction lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 MEDIATION

§ 15.3.1 [Deleted]

§ 15.3.2 The parties may agree to engage in mediation to resolve their Claims.

§ 15.3.3 [Deleted]

§ 15.4 ARBITRATION

§ 15.4.1 Every Claim shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the Arbitration Service of Portland, Inc., in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the Arbitration Service of Portland, Inc., unless the parties elect another person or entity to administer arbitration proceedings. Exclusive venue for arbitration shall be Clatsop County, Oregon.

§ 15.4.1.1 A demand for arbitration shall be delivered in writing to the other party within a reasonable time after the claim, dispute or other matters in question have arisen, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations or repose purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 CONSOLIDATION OR JOINDER

§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitrations to be consolidated substantially involve common questions of law or fact, and (2) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.

§ 15.4.4.4. Prior to allowing any subcontractor or other party retained by the Contractor to commence work on the Project, the Contractor shall require such third party to consent in writing to arbitration if requested by the Owner or the Contractor.

END OF THE GENERAL CONDITIONS

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PAGE 1

for the following PROJECT:

...

A new Seaside School District campus, which will include the following components, which are further:

(1) Closing existing buildings that operate in the City of Seaside's tsunami zone;

(2) Constructing a new facility on land donated by Weyerhaeuser Company, which will operate as Seaside High School and Broadway Middle School; and

(3) Renovation and expansion of Seaside Heights Elementary School.

...

~~*(Name, legal status*~~ *(Name and address)*

...

SEASIDE SCHOOL DISTRICT 10
1801 SOUTH FRANKLIN STREET
SEASIDE, OREGON 97138

...

~~*(Name, legal status*~~ *(Name and address)*

...

BRIC ARCHITECTURE, INC.
1233 NW NORTHRUP STREET, SUITE 100
PORTLAND, OREGON 97209

...

THESE GENERAL CONDITIONS APPLY TO THE AGREEMENT BETWEEN THE OWNER AND CONTRACTOR, AIA DOCUMENT A133-2009, AS AMENDED, DATED JULY 3, 2017.

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The Contract Documents are enumerated in the Agreement between the Owner and Contractor ~~(hereinafter the Agreement)~~ identified on page 1 of these General Conditions (hereinafter the "Agreement") and consist of the Agreement, Conditions of the Contract ~~(General, Supplementary and~~ (these General Conditions and any Supplementary Conditions or other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

...

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties ~~hereto~~ and supersedes all prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect and the Contractor shall, however, be entitled to performance and enforcement of obligations of the other under the Contract intended to facilitate performance of ~~the Architect's~~ their respective duties.

...

The term "Work" means the construction and services required of the Contractor by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

...

~~Instruments~~ Instruments of Service are representations, Drawings, Specifications, and other documents, including those in electronic form, of the tangible creative work performed by the Architect and the Architect's consultants for the Project under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

...

§ 1.1.8 THE INDEMNITEES The "Indemnitees" are Owner and its officers, directors, volunteers, agents, representatives, and employees.

...

§ 1.1.9 AFFILIATED ENTITY OR AFFILIATED ENTITIES

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~~of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.~~ The term "Affiliated Entity" shall mean the Contractor (if self-performing a portion of the Work), a parent, subsidiary, affiliate, or other entity having common

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ownership or management with the Contractor; any entity in which any stockholder in, or management employee of, the Contractor, or the Contractor itself, owns any interest in excess of ten percent (10%) in the aggregate; or any person or entity that has the right to control the business or affairs of the Contractor. The term "Affiliated Entity" includes any member of the immediate family of any person identified above.

...

§ ~~1.1.8 INITIAL DECISION MAKER~~**1.1.10 CONSTRUCTION MANAGER/GENERAL CONTRACTOR**

...

~~The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.~~All references to the term "Contractor" in these General Conditions shall mean the Construction Manager/General Contractor identified in the Agreement.

...

§ 1.2.2 ~~Organization of the Specifications into divisions, sections~~ The terms of any document that forms the Contract are subject to the following order of precedence:

...

.1 Modifications;

...

.2 The Agreement;

...

~~and articles,~~ **.3** These General Conditions and supplementary conditions;

...

~~and arrangement of Drawings shall not control the Contractor in dividing~~ **.4** Drawings, Specifications, and Addenda issued before execution of the Contract, subject to Section 1.2.4;

...

~~the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.~~**.5** Other documents incorporated by the terms of the Contract Documents.

...

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings. Dimensions not expressly provided in the Contract Documents are to be computed, rather than determined by scale or rule.

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...

§ 1.2.4 If there is an inconsistency within or between (1) any Drawings, Specifications, or Addenda issued before execution of the Contract, or (2) any Drawings, Specifications, or Addenda and applicable standards, codes, and ordinances, and the inconsistency is not clarified by a Modification or by the Architect, then the Contractor shall provide the better quality or greater quantity of Work without requiring a change to the Contract Sum. The terms and conditions of this Section 1.2.4, however, shall not relieve the Contractor of any of the obligations set forth in Section 3.2.

...

§ 1.2.5 The organization of the Specifications into divisions, sections and articles, and the arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

...

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of ~~Architects.~~Architects, or substitute for those documents that may be used on the Project, or (4) the titles of or terms defined in the Owner's policies incorporated in these General Conditions.

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§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. ~~Submittal or distribution~~ The submittal or distribution of the Instruments of Service to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

...

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

...

§ 2.1.2 ~~The~~ **[Deleted]**

...

~~Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.~~ **§ 2.1.3** Notwithstanding anything to the contrary in any Contract Document, no officer, director, trustee, partner, authorized representative, employee, student, volunteer, agent, or other representative of the Owner shall have any personal liability to the Contractor or any other person or entity

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other than the Owner for any acts or omissions arising out of or relating to these General Conditions or the Agreement, whether based on tort, contract, statute, administrative laws, or otherwise.

...

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. ~~The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.~~ Any request made after the commencement of the Work shall not serve as a basis for the Contractor to stop the Work.

...

§ 2.2.3 ~~The Owner shall furnish surveys describing~~ Except to the extent required for execution of the Work and requested by the Contractor in writing, the Owner shall not furnish surveys, studies, or reports regarding physical characteristics, legal limitations and utility locations for the site of the Project, ~~and~~ but shall provide a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

...

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents ~~with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work~~ with reasonable promptness after receiving the Contractor's written request for such information or ~~services.~~services.

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§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner ~~shall furnish~~ or the Architect shall provide to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2. Additional copies may be purchased by the Contractor at the cost of reproduction and handling.

...

§ 2.3.1 If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 ~~or repeatedly~~ fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

...

§ 2.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, ~~correct such~~ commence and continue to carry out the Work, including without limitation the correction of any deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. ~~Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect.~~ If

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payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

...

§ 2.4.2 If the Contractor's default or neglect results in a hazard to the safety of persons or property, the Owner may immediately commence or continue to carry out any Work necessary to mitigate the hazard without prior notice to the Contractor.

...

§ 2.4.3 The Owner's right to carry out the Work in this Section 2.4 shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity.

...

§ 2.5 The Owner may notify the Contractor that it needs to exclude or remove from the Project site any or all employees, agents, suppliers, or representatives of the Contractor or its Subcontractors who threaten the safety of others or are disruptive to the Project or the Owner's operations and activities. The Contractor will supply replacement personnel promptly after receiving notice of the exclusion or removal. Each replacement must have qualifications and experience comparable to or better than the individual or entity being replaced and be reasonably acceptable to the Owner. Nothing in this Section requires the Contractor to take any particular employment or contract action with regard to an employee or Subcontractor.

...

§ 2.6 RIGHTS and REMEDIES

...

Consistent with Section 13.4, the rights described in Sections 2.3 through 2.5 shall be in addition to, and not in restriction of, the Owner's other rights or remedies.

...

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. ~~The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located.~~ The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

...

§ 3.1.1.1 The Contractor and each of its Subcontractors must be licensed with the Oregon Construction Contractors Board at the time of solicitation of any work and throughout the entire course of the Work. The Contractor shall maintain all required bonding and insurance required by the State of Oregon and the Contract Documents throughout the entire course of the Work.

...

§ 3.1.1.2 The Contract is applicable to contractors who are owned or controlled by, or act as agents of, the Contractor for purposes of the Project.

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§ 3.1.2 The Contractor shall supervise, coordinate, and perform the Work in accordance with the Contract ~~Documents.~~Documents in a professional, safe, and workmanlike manner and in accordance with all laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and professional standards applicable to the industries and trades involved, including without limitation strict compliance with all applicable federal, state, and local laws and building codes and certification requirements applicable to the Work.

...

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Owner or the Architect in the ~~Architect's~~ administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

...

§ 3.1.4 Unless otherwise directed by the Architect, the Contractor shall perform all Work in accordance with product manufacturers' recommendations or directions for best results. No preparatory step or installation procedure may be omitted unless specifically authorized by the Contract Documents or at the direction of the Architect. Conflicts among manufacturers' directions or the Contract Documents shall be resolved by the Architect.

...

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents. In addition:

...

.1 The Contractor and each Subcontractor, as a condition precedent to commencement of the Work, shall:

...

(a) become familiar with the location, condition, layout, and nature of the Project Site and surrounding areas and generally prevailing climate conditions;

...

(b) review all analyses, studies, and test data available to the Contractor concerning the conditions of the Project site;

...

(c) inspect the location of the Project site and satisfy themselves as to its condition, including all observable structural, surface, and subsurface conditions to the extent information is provided by the Architect and can be viewed;

...

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(d) evaluate the availability and cost of labor and trade Subcontractors and the availability and cost of materials, tools, and equipment; and

...

(e) determine (i) that the Contract Sum and GMP are just and reasonable compensation for all the Work, including all foreseen and foreseeable construction risks, hazards, and difficulties for which the Contractor is responsible under the Contract Documents, (ii) that the Contract Time is adequate for the performance of the Work, and (iii) that the means and methods of performing the Work will not result in any lateral or vertical movement of any adjacent structure.

...

The Contractor or Subcontractor must notify the Owner in writing before commencing the Work if it determines that it cannot satisfy one or more of these conditions.

...

.2 The Owner shall not be required to make any adjustment in either the Contract Sum or the Contract Time in connection with any failure by the Contractor or any Subcontractor to have complied with the requirements of this Section 3.2.1.

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§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner ~~pursuant to Section 2.2.3,~~ and, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect and the Owner any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Owner or the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

...

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor ~~shall~~ shall:

...

.1 promptly report to the Owner and the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may ~~require.~~ require;

...

.2 include within the Guaranteed Maximum Price all Costs of the Work that are necessary for the Project to comply with all applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities.

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...

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections ~~3.2.2 or~~ 3.2.1 through 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections ~~3.2.2 or~~ 3.2.1 through 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those ~~obligations,~~ obligations and could not have recognized the applicable error, inconsistency, omission, or difference in the exercise of normal diligence, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public ~~authorities.~~authorities, recognized in the exercise of normal diligence.

...

§ 3.2.5 Unless otherwise specified in the Contract Documents, the Contractor shall confirm the location of each utility and shall excavate and dispose of each on-site utility. The Owner has made available to the Contractor, and the Contractor has studied, the results of such test borings and information that the Owner has concerning subsurface conditions and site geology. At the Owner's request, the Contractor will make available to the Owner the results of any other site investigation, analyses, studies, or other tests conducted by or that are in possession of the Contractor or any of its agents. The Contractor shall exercise special care in executing subsurface work in proximity of known subsurface utilities, improvements, and easements.

...

§ 3.3.1 The Contractor shall ~~supervise~~ supervise, coordinate, and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Owner or the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner or the Architect shall be ~~solely~~ responsible for any loss or damage arising ~~solely~~ from those Architect- or Owner-required means, methods, techniques, sequences or procedures.

PAGE 17

§ 3.3.4 The Contractor must notify the Owner at least ten (10) days prior to the interruption of any utility or operating system, regardless of the area it services. The specific schedule for all interruptions in services must be coordinated through the Owner's Representative.

...

§ 3.3.5 The Contractor and its Subcontractors may not use the Owner's tools, equipment, or materials unless authorized in advance by the Owner's Representative.

...

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§ 3.3.6 If the Contractor reasonably believes that suspension of the Work is warranted by reason of unforeseen circumstances that could adversely affect the quality of the Work if the Work were continued, the Contractor shall immediately notify the Owner and the Architect and describe with particularity the reasons therefor. Except as stated elsewhere in the Contract Documents or in an emergency, the Contractor shall not suspend the Work until it receives approval from the Owner.

...

§ 3.3.7 It is understood and agreed that the relationship of Contractor to Owner shall be that of an independent contractor under ORS 670.600. Nothing contained in this Agreement or inferable from this Agreement shall be deemed or construed to (a) make Contractor the agent, servant, or employee of the Owner; or (b) create any partnership, joint venture, or other association between Owner and Contractor. Any direction or instruction by Owner or any of its authorized representatives in respect to the Work shall relate to the results the Owner desires to obtain from the Work, and shall in no way affect Contractor's independent contractor status.

...

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

...

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the prior written consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

...

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them. The Contractor shall hire all personnel for the proper and diligent prosecution of the Work, and maintain labor peace for the duration of the Project. In the event of a labor dispute, the Contractor shall not be entitled to any increase in the Contract Sum.

...

§ 3.4.4 Including, but not limited to the specific requirements of Section 10.1.1, Contractor, its Subcontractors, and vendors shall bear responsibility for compliance with all federal and state laws, regulations, guidelines, and ordinances pertaining to worker safety and applicable to the Work. Contractor further recognizes that the Owner and Architect do not owe the Contractor any duty to supervise or direct Contractor's work so as to protect the Contractor from the consequences of Contractor's own conduct.

...

§ 3.5 WARRANTY

...

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit.

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Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the ~~Architect,~~ Architect or the Owner, the Contractor shall furnish satisfactory evidence ~~as to~~ about the kind and quality of materials and equipment.

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§ ~~3.6 TAXES~~**3.5.2 CORRECTION OF WORK** If, after 10 days' notice, the Contractor fails to proceed to cure any breach of this warranty, the Owner may have the defects corrected and the Contractor and its surety, if any, shall be liable for all expense incurred. In case of an emergency where, in the opinion of the Owner or the Architect, delay would cause serious loss or damage, if any, corrective work may be undertaken without advance notice to the Contractor, but the Contractor and its surety shall remain liable for all expenses incurred. The remedies stated in this Section 3.5 are not exclusive, but are cumulative of any other Owner remedies.

...

§ 3.5.3 THIRD-PARTY WARRANTIES

...

~~The Contractor shall pay sales, consumer, use and similar taxes~~ .1 The Contractor shall obtain from Subcontractors, manufacturers, and suppliers written guarantees and warranties consistent with any requirements of the Contract Documents. If the Contract Documents do not contain requirements for written guarantees or warranties, then the Contractor will obtain the optimum terms and longest periods reasonably obtainable. The documentation must also include all maintenance and operational documentation required to sustain the warranties.

...

~~for the Work provided~~ .2 All guarantees or warranties of third parties furnished to the Contractor or Subcontractor, including without limitation from any manufacturer or supplier, shall be deemed to run for the benefit of the Owner.

...

.3 The Contractor shall deliver to the Owner via the Architect electronic or hard-copy versions of all as-built documents and guarantees and warranties on materials, systems, and equipment furnished by ~~the Contractor that~~ all manufacturers and suppliers to the Contractor and all its Subcontractors, with duly executed instruments properly assigning the guarantees and warranties to the Owner. These warranties in each bound volume shall be grouped together by trade and properly indexed. The Contractor shall assign and deliver to the Owner all manufacturers' warranties not later than the date of Substantial Completion.

...

.4 Until Substantial Completion, the Contractor shall perform and document all required maintenance of equipment and systems and maintain in force all warranties.

...

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§ 3.5.4 ASSIGNMENT OF WARRANTIES

...

The Contractor hereby assigns to the Owner all warranties and guarantees of all Subcontractors and Sub-subcontractors, but the assignment shall not relieve the Contractor of its warranty obligations to the Owner under these General Conditions and other Contract Documents.

...

§ 3.5.5 REMEDIES

...

~~are legally enacted when bids are received~~ Consistent with Section 13.4, the remedies stated in this Section 3.5 are not exclusive, but are cumulative of any other Owner remedies.

...

§ 3.6 TAXES

...

~~or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.~~The Contractor shall pay all necessary local, county, and state taxes, income tax, compensation tax, social security, and withholding payments as required by law. Contractor hereby RELEASES, INDEMNIFIES, AND HOLDS HARMLESS Owner from any and all claims and demands made as a result of the failure of Contractor or any Subcontractor to comply with the provisions of any or all such laws and regulations.

...

§ 3.7 PERMITS, FEES, ~~NOTICES~~ NOTICES, AND COMPLIANCE WITH LAWS

...

§ 3.7.1 Unless otherwise provided in the Contract Documents, the ~~Contractor~~ Owner shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

PAGE 19

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect ~~determines~~ determines, after considering Section 3.2, that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

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...

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. For the purposes of these Contract Documents, the term "wetland" includes wetlands and water bodies subject to the federal Clean Water Act and parallel state and local rules, statutes, and regulations. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

...

.1 ~~Allowances~~ allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

...

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum ~~but not~~ and in the allowances; and

...

.3 ~~Whenever~~ whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2. Savings realized on an allowance shall be returned to the Owner as a reduction in the Contract Sum.

...

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner ~~with reasonable promptness.~~in sufficient time to avoid delay in the Work

...

§ 3.9.1 The Contractor shall ~~employ a competent superintendent~~ continuously employ a competent superintendent, project manager, and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent and project manager shall represent the Contractor, and communications given to the project manager or superintendent shall be as binding as if given to the Contractor.

...

§ 3.9.2 The ~~Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through~~ project manager and the superintendent shall be those persons named in the Contractor's proposal.

...

~~the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.~~ **§ 3.9.3** So long as the project manager and the superintendent remain employed by the Contractor, the Contractor may not otherwise remove or replace the project manager, superintendent, or assistants, or cause them to leave the Project for any reason, including without

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limitation to work on other projects or take extended vacations, without 45 days' advance written notice to and the prior consent of the Owner. The Owner shall be consulted by the Contractor with respect to replacement personnel pursuant to the requirements of the Contract.

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§ 3.9.3 The Contractor shall ~~not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.~~ **3.9.4 New or replacement project managers, superintendents, and assistants must be qualified and must have adequate experience with similar projects. The Contractor shall deliver to the Owner résumés of proposed new or replacement project managers, superintendents, and assistants.**

...

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's ~~information~~ approval a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the ~~Work.~~Work within the Contract Time.

...

§ 3.10.3 The Contractor shall perform the Work in ~~general~~ accordance with the most recent schedules submitted to the Owner and Architect.

...

§ 3.11.1 The Contractor shall maintain at the site for the Owner one record as-built copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one record copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These as-build documents shall incorporate all changes and substitutions to the Work, including without limitation changes or substitutions arising from change orders, construction change directives, and details clarified by requests for information, supplemental instructions or approved shop drawings. The Contractor's as-built documentation shall be available to the Architect and the Owner during the course of the Project.

...

§ 3.11.2 The Contractor shall maintain all approved permit drawings in a manner that will make them accessible at the Project site to governmental inspectors and other authorized agencies. All approved drawings shall be ~~**delivered to the** Architect for submittal~~ **wrapped, marked, and delivered to the Owner within 60 days of Substantial Completion.**

...

~~**to the** Owner upon completion **of the Work**~~ **§ 3.11.3 The Contractor must continuously maintain at the Project site all material safety data sheets, safety records, daily logs, and other Contract documentation necessary to immediately ascertain the safety of the Work and to establish compliance with life safety policies, hazardous materials requirements, and the Contract Documents.**

...

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~~as a record of the~~ Work as constructed. **§ 3.11.4 The Contractor, with its Subcontractors, will prepare draft record Contract Documents, showing all as-built conditions as required under Section 3.11.1, and submit them to Architect for review. Based on Architect's review and comments, if any, Contractor will prepare and deliver to Owner within 60 days of Substantial Completion, final, accurate, and complete record Contract Documents, including without limitation record Drawings and Specifications, showing the exact "as-built" conditions of the Work.**

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§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence ~~as~~ in order to cause no delay in the Work or in the activities of the Owner or of separate contractors.

...

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, ~~provided~~ to the extent that the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

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§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

...

§ 3.13.2 Prior to commencement of the Work, the Contractor shall review the Project site with the Owner in detail and identify the area of the Work, staging areas, connections or interfaces with existing structures and operations, and restrictions on the Project site area. The Contractor will ensure that all forces on the Project site are instructed about the acceptable working and staging areas and restrictions on use of the site. The Contractor, with advance consent of the Owner, will erect such barriers, signage, and devices as are necessary to restrict access to the Project site to approved personnel and to prevent unauthorized access by construction personnel to non-Work areas.

...

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§ 3.13.3 The Contractor and its Subcontractors shall receive prior approval from the Owner before delivering or storing any materials or tools on the Owner's premises. Upon approval, materials and tools will be stored so that they do not hamper the operation of equipment or persons and do not present a fire or safety hazard.

...

§ 3.13.4 Contractor and its Subcontractors shall not erect on the Project site any signage intended to advertise or promote their business without the prior written consent of the Owner.

...

§ 3.13.5 If the Contractor removes the Owner's property, fixtures, materials, or other equipment to perform the Work, the Contractor shall be responsible for the safekeeping of all such property, fixtures, materials, or other equipment including without limitation assuring that such items are not lost, damaged, destroyed, and are upon the Owner's directive are either returned to their original location, reinstalled, replaced, or repaired as necessary.

...

§ 3.13.6 When all or a portion of the Work is suspended for any reason, the Contractor shall securely fasten down all coverings and protect the Work, as necessary, from damage by any cause.

...

§ 3.15.1 The Contractor ~~shall~~ shall, each work day, keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the ~~Contract.~~Contract.

...

§ 3.15.2 At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, ~~machinery~~ machinery, and surplus materials from and about the Project.

...

§ ~~3.15.2~~ 3.15.3 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

...

§ 3.16.1 The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

PAGE 23

§ 3.16.2 Keys. The Contractor will be responsible for all keys issued to it or its Subcontractors for mechanical or other locked rooms. Keys will be obtained from the Owner and may not be copied, transferred, or used for any purpose other than prosecution of the Work. All keys will be returned to the Owner at the conclusion of the Work and as a condition precedent to final payment of the Contractor. If all keys are not returned and the Owner determines, in its reasonable discretion, to rekey affected locks, the Contractor will pay the cost of rekeying all affected locks. This remedy is not exclusive of any other remedy of the Owner. The term "key" includes any device used to secure a room or areas in the Owner's premises, whether by mechanical, electronic, or other means.

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...

§ 3.16.3 **Identification.** The Architect and its Consultants, the Contractor and its Subcontractors, and the employees and agents of any of them shall comply with the Owner's policies and requirements, if any, to obtain, display, and return identification badges at any time while they are present on the Owner's property.

...

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Owner and the Architect.

...

§ 3.18.1 To the fullest extent permitted by law the Contractor shall ~~indemnify~~ indemnify, defend, and hold harmless the ~~Owner, Architect, Architect's consultants, and agents~~ Owner and its agents, volunteers, representatives, students, and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' and experts' fees, arising out of or resulting from performance of the ~~Work, provided that such claim, damage, loss or expense is attributable to bodily injury,~~ Work by the Contractor, a Subcontractor (of any tier), or anyone for whose acts they may be liable:

...

~~sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent.~~ .1 For death, personal injury (including without limitation sickness, disease, or bodily injury), or property damage to the extent caused by (a) the material breach of these General Conditions or the Contract Documents; (b) violation of laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities; or (c) any negligent or tortious acts or omissions of the Contractor, a ~~Subcontractor, anyone directly or indirectly employed by them~~ Subcontractor (of any tier), or anyone for whose acts they may be ~~liable, regardless~~ liable; and

...

~~of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder.~~ .2 For claims for any violation of federal, state, or local laws or regulations relating to labor or employment, including without limitation wage-and-hour or benefit claims, asserted by or on behalf of an employee or employees of the Contractor, a Subcontractor (of any tier), or anyone for whose acts they may be liable.

...

Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity ~~that~~ which would otherwise exist as to a party or person described in this Section 3.18.

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§ 3.18.3 Notwithstanding anything to the contrary in this Section 3.18, the Contractor is not required to indemnify the Owner or its agents and their respective volunteers, representatives, students, and employees for, from, and

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against liability for damage arising out of death or bodily injury to persons or damage to property caused in whole or in part by the negligence or willful misconduct of the Owner or its agents or their respective employees, but the Contractor is required to indemnify the Owner and its agents and their respective employees for, from, and against liability for damage arising out of death or bodily injury to persons or damage to property to the extent that the death or bodily injury to persons or damage to property arises out of the fault of the Contractor, or the fault of the Contractor's agents, representatives, or Subcontractors. The obligations of the Contractor under this Paragraph 3.18 shall not extend to the liability of the Architect, the Architect's consultants, and agents and employees of any of them arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Architect, the Architect's consultants, and agents and employees of any of them provided that such giving or failure to give is the Architect's responsibility and the primary cause of the injury or damage.

...

§ 4.1.1 The ~~Owner shall retain an architect~~ Architect is the person lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

...

§ 4.1.3 If the employment of the Architect is terminated, the Owner ~~shall~~ may employ a successor architect as ~~to~~ whom the Contractor has no reasonable ~~objection and whose status under the Contract Documents shall be that of the Architect.~~objection. The Owner shall consider any reasonable objections of the Contractor, but the choice of the successor architect will solely that of the Owner.

...

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate ~~for~~ For Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

...

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, (1) to become ~~generally~~ familiar with the progress and quality of the portion of the Work completed, ~~and to determine in general if the Work observed~~ (2) to guard the Owner against defects and deficiencies in the Work, and (3) to determine if the Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

...

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) ~~known~~ deviations and substitutions from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies ~~observed~~ in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

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...

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner. All communications involving a change in the cost of the Work must be copied to the Owner. Notwithstanding the above, the Owner may communicate directly with the Contractor.

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§ 4.2.6 The Architect has authority to reject Work and documentation that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work. The Architect shall inform the Owner contemporaneously with any rejection of Work or documentation.

...

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, ~~with reasonable promptness~~ in a manner not to cause delay in the Work while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

...

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section ~~9.10;~~ 9.10 and Section 3.5; and issue a final Certificate for Payment pursuant to Section 9.10.

...

§ 4.2.13 ~~The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.~~ **[Deleted]** The Owner shall discuss matters related to the aesthetic intent and effect with the Architect and Contractor. The Architect may propose a solution, but the final decision shall be that of the Owner.

...

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise ~~with~~

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~~reasonable promptness.~~ in a manner not to cause delay in the Work. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

...

§ 5.1.1 A Subcontractor is a person or entity who has a ~~direct~~ contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

PAGE 26

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner ~~through~~ and the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Owner or the Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect or the Owner requires additional time for review. Failure of the Owner or Architect to reply within the ~~14 day~~ 14 day period shall constitute notice of no reasonable objection. Failure of the Owner to object to a Subcontractor does not imply approval of specific products or materials.

...

§ 5.2.3 ~~If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.~~Subcontractors shall be selected as provided in the Contract and the

...

Guaranteed Maximum Price Amendment.

...

By appropriate ~~agreement, written where legally required for validity,~~ written agreement, the Contractor shall require each ~~Subcontractor,~~ subcontractor (a) to the extent of the Work to be performed by the ~~Subcontractor,~~ subcontractor, to be bound to the Contractor by ~~terms of the Contract Documents, and~~ the scope of Work and requirements of the Contract Documents; (b) to assume toward the Contractor all ~~the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor~~ duties, obligations, and conditions imposed by the terms and conditions of the Contract Documents that the Contractor assumes toward the Owner; and (c) to affirm the same representations to the Contractor that the Contractor makes to the Owner. The Contractor shall require each subcontractor to enter into similar agreements with ~~Sub-subcontractors.~~ sub-subcontractors of every tier. The Contractor shall make available to each proposed ~~Subcontractor,~~ subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the ~~Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of~~

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~~applicable portions of such documents available to their respective proposed Sub-subcontractors.~~subcontractor will be bound.

...

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 ~~and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing;~~ or stoppage of the Work by the Owner pursuant to Section 2.3.1; and

...

§ 5.5 DESIGN-BUILD SUBCONTRACTORS

PAGE 27

The Contractor may retain various Subcontractors to perform design-build portions of the Project ("Design-Build Subcontractors"), which the Contractor shall identify in advance to the Owner before design-build work commences. The Contractor assumes the obligation, as a contractual duty to the Owner, to deliver a completed and functioning Project in accordance with the Contract Documents, including without limitation all designs provided by the Design-Build Subcontractors. The Contractor is not itself a designer and does not independently approve the details of the designs of Design-Build Subcontractors. The Contractor shall place in its subcontracts with each of its Design-Build Subcontractors the following terms and conditions:

...

.1 The Owner is an intended third-party beneficiary of the design-build subcontract and the Design-Build Subcontractor's services and Work. The Design-Build Subcontractor is not a third-party beneficiary of the Contract or any other agreement between the Contractor and the Owner, or between the Owner and the Architect or the Architect's consultants.

...

.2 The Design-Build Subcontractor shall maintain through the Project, and for six (6) years after Substantial Completion of the Project, standard professional liability/errors-and-omissions insurance that is (a) in a form and with an insurance company satisfactory to the Contractor and the Owner, and (b) in compliance with the minimum insurance coverage requirements in Article 11 of these General Conditions.

...

.3 The Design-Build Subcontractor's professional errors and omissions insurance will have the terms and limits as required in Section 11.1 of these General Conditions or as agreed in advance by the Owner and the Contractor.

...

.4 The Design-Build Subcontractor shall notify the Contractor and the Owner no less than thirty (30) days before any cancellation, nonrenewal, or material modification of the professional errors and omissions insurance.

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...

.5 The Design-Build Subcontractor shall submit to the Owner and the Contractor proof of all such insurance before commencing Work on the Project.

...

The Contractor shall also ensure that the design-build subcontracts contain no limitation-of-liability

...

~~ARTICLE~~ clauses.

...

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

...

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the ~~site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation.~~ site. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

...

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the ~~Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.~~Contract.

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§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect and the Owner apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor to so ~~to~~ report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except ~~as to~~ for defects not then reasonably discoverable.

...

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for unavoidable costs the Contractor incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction. All construction costs resulting from Contractor's negligence, lack of oversight, inattention to detail, failure to investigate or failure to follow the Construction Documents or Contract Documents will be borne by the Contractor, subject to the terms and conditions of the Contract Documents and the Guaranteed Maximum Price Amendment.

...

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§ 6.2.4 The Contractor shall promptly remedy damage the Contractor ~~wrongfully~~ causes to completed or partially completed construction or to property of the ~~Owner or~~ Owner, separate contractors as provided in Section 10.2.5. If a separate contractor initiates legal or any other proceedings against the Owner on account of any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor, who shall defend such proceedings and indemnify the Owner against any judgment or award, including without limitation costs and attorney fees. This Section 6.2.4 does not require the Contractor to indemnify the Owner against liability for damage arising out of death or bodily injury to persons or damage to property to the extent that the liability was caused by the negligence or intentional misconduct of the Owner.

...

If a dispute arises among the Contractor, separate contractors and the Owner ~~as to~~ about the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

...

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change ~~Order, Construction Change Directive or order for a minor change in the Work,~~ Order or Construction Change Directive, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

...

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the ~~Contractor; an order for a minor change in the Work may be issued by the Architect alone.~~Contractor.

...

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change ~~Order, Construction Change Directive or order for a minor change in the Work.~~Order or Construction Change Directive.

PAGE 29

§ 7.2.2 Before approval of a Change Order and upon request of the Architect or the Owner, the Contractor will produce copies of all bids or other proposals, including those from Subcontractors and Sub-subcontractors, related to the Work proposed to be performed pursuant to the Change Order.

...

§ 7.2.3 Agreement on any Change Order shall constitute a final settlement of all matters relating to the changes in the Work that is the subject of the Change Order, including without limitation all direct and indirect costs associated with such change and any and all adjustments to the Contract Sum and the construction schedule.

...

§ 7.3.1 A Construction Change Directive is a written order normally prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

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...

§ 7.3.2 A Construction Change Directive ~~shall~~ may be used in the absence of total agreement on the terms of a Change Order.

...

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect and Owner of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

...

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Owner and the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in ~~the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount.~~ Section 7.5 of these General Conditions. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Owner and the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, ~~costs~~ reasonable expenditures for the purposes of this Section 7.3.7 shall be limited to the following:

...

.1 Costs of labor, including social security, ~~old age and~~ unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

PAGE 30

.4 ~~Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes~~ permit fees, taxes, and increased costs of bonds and insurance (if such increases are necessitated by the Construction Change Directive related to the Work; and

...

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Owner and the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

...

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor will submit to Owner for approval a not-to-exceed price for performance of the Work required by the Construction Change Directive. The Contractor may request payment for Work completed under the Construction Change Directive in Applications for ~~Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's~~ Payment, but the Owner is not obligated to make payments for Work completed under the Construction Change Directive until the parties agree on a not-to-exceed price. If the parties do not agree on a not-to-exceed price within 30 days after the Owner's issuance of the Construction Change Directive to the Contractor, then the Owner will make an interim determination on the amount owed to the Contractor for Work completed under the Construction Change Directive. The Owner's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

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...

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. ~~Such changes~~ After the Architect communicates to the Owner that a minor change has been made, the change will be effected by written order signed by the Architect and shall be binding on the Owner and ~~Contractor.~~Contractor.

...

§ 7.5 AGREED OVERHEAD AND PROFIT RATES

...

§ 7.5.1 For any adjustments to the Guaranteed Maximum Price that are based on other than the unit prices method, the Contractor will charge, and accept, as payment for overhead and profit, the following percentages of costs attributable to the change in the Work. The following overhead and profit rates shall also apply to adjustments to subcontracts that do not adjust the Guaranteed Maximum Price.

...

.1 For work performed by the Construction Manager's own forces, the following markups shall apply:

...

Job Services for incidental pick up Work (by Hoffman Structures): For all job services related to incidental pick up Work performed by Hoffman Structures, Construction Manager will apply (i) an administrative fee equal to 3% of the actual costs for labor, labor burden, taxes, and fringes and (ii) a Construction Manager's fee, equaling 3.1% of the actual costs for labor, labor burden, taxes, and fringes.

...

Survey Services (by Ming Surveying): For all surveying services performed by Ming Surveying, Construction Manager will apply a Construction Manager's fee equaling 3.1% of the surveying costs. Construction Manager will bill surveying costs to Owner at a total rate of $230 per hour through the end of the 2018 calendar year. The rate will be adjusted annually thereafter in accordance with the Consumer Price Index, subject to Owner's prior written approval. Construction Manager will also verify that Ming Survey's rate meets local market costs prior to commencing Work.

...

Hoffman Equipment Yard Rental: For equipment owned by Construction Manager or Affiliated Entities, Construction Manager will apply markup equaling 10% of the rental equipment cost. But the sum of (a) the rental equipment cost and (b) markup referenced in this paragraph may not exceed 75% of market rental rates. Construction Manager may, however, apply the Construction Manager's Fee to the rental equipment cost and markup even if application of the Construction Manager's Fee causes the total cost to exceed 75% of market rental rates.

PAGE 31

Third Party Equipment Rentals: For equipment not owned by Construction Manager or Affiliated Entities, Construction Manager will apply (i) a yard overhead cost equaling 7% of the total cost of renting the equipment and (ii) a Construction Manager's fee, equaling 3.1% of the total cost of renting

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the equipment. The total cost of renting the equipment as referenced in this paragraph equals 100% of the cost incurred by Construction Manager to rent the equipment from the third party.

...

Permanently Installed Work (by Hoffman Mechanical, Hoffman Structures, etc.): For permanently installed Work that is competitively bid, such as concrete, mechanical or plumbing, Construction Manager will apply a fee equaling 3.1% of the cost of that permanently installed Work.

...

.2 For Work performed by a Subcontractor, the Contractor may claim no more than the percentage applied to calculate the Contractor's Fee or five percent (5.0%) of the actual amount due to the Subcontractor for the Cost of the Work, whichever is less.

...

.3 For Work performed by a Subcontractor or Sub-subcontractor, the Subcontractor or Sub-subcontractor may claim no more than ten percent (10.0%) of its actual Cost of the additional Work.

...

.4 For Work performed by a Sub-subcontractor, its Subcontractor may claim a markup of no more than the percentage applied to calculate the Subcontractor's Fee or ten percent (10.0%) of the amount actually payable to the Sub-subcontractor for the Cost of the Work, whichever is less.

...

.5 The Costs of the Work to which overhead and profit are to be applied at any tier are determined by Article 6 of the Agreement.

...

.6 All cost proposals, except those so minor that their propriety can be readily determined, must be accompanied by a complete itemization of costs, including without limitation the costs of labor, materials, subcontracts, and sub-subcontracts. Subcontractor costs exceeding $1,500 must be similarly itemized.

...

.7 All general conditions or general requirements costs of the Contractor, Affiliated Entities, and all Subcontractors of any tier are not included in the markups listed in Section 7.5.1.1.

...

.8 The Contractor bears the burden of establishing the reasonableness of any proposed increase in the Contract Sum or Contract Time.

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...

§ 7.5.2 Overhead and profit adjustments for net decreases in the cost of any portion of the Work shall include a deduction of the overhead and profit, fee, and general conditions or general requirements costs that would be allowed for that Work by the terms of Section 7.5.1.

...

§ 7.5.3 Overtime, when specifically authorized by the Owner and not as an extraordinary measure, shall be paid for by the Owner on the basis of premium payment only, plus the cost of insurance and taxes based on the premium payment period. The Owner will not pay overhead and profit for overtime.

...

§ 8.1.1 ~~Unless otherwise provided,~~ The Contract Time is the period of ~~time, including authorized adjustments, allotted in the Contract Documents for~~ time from the date of commencement to Substantial Completion of the Work.

...

§ 8.1.3 ~~The date of Substantial Completion is the date certified by the Architect in accordance with~~ Substantial Completion is defined in Section 9.8.

PAGE 32

§ 8.2.1 Time is of the essence of this Contract. Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

...

§ 8.2.2 ~~The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such~~ Consistent with Section 11.1.10, the date of commencement cannot occur before placement of insurance. The Contractor will not commence Work or enter the Project Site before placement of insurance.

...

§ 8.3.1 If the Contractor is delayed at any time in ~~the commencement or~~ progress of the Work by an act ~~or neglect~~ of negligence of the Owner or the Architect, or of an employee of ~~either,~~ either involved in the Project, or of a separate contractor employed by the ~~Owner;~~ Owner, or by changes ordered in the ~~Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.~~ Work, or by occurrences beyond the control and without the fault or negligence of the Contractor or its Subcontractors and that by the exercise of reasonable diligence the Contractor is unable to prevent or provide against, including industry-wide labor disputes, fire, unusual and extended delays in deliveries, unavoidable casualties, adverse weather conditions not reasonably anticipated, or other occurrences that the Owner determines may justify delay, then the Contractor may obtain an extension of the Contract Time and adjustment to Contract Sum only upon satisfying the prerequisite conditions of (a) compliance with Subparagraph 15.1.3 of the General Conditions and (b) presentation to the Owner and the Architect of written notice of the request for an extension of the Contract Time as provided in Subparagraph 15.1.5.1. The Contract Time and Contract Sum may under these circumstances be adjusted by Change Order for the additional time actually and directly caused by the unforeseen occurrence. The extension will be net of any delays caused by or due to the fault or negligence of the Contractor and will also be net of any contingency or "float" time allowance included in the Project Schedule. In the event delays in

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the Work are encountered for any reason, the Owner and Contractor shall undertake reasonable steps to mitigate the effect of such delay.

...

§ 8.3.2 ~~Claims relating to time shall be made in accordance with applicable provisions of Article 15.~~The Contract Time is set with reference to and knowledge of weather conditions usual to the area of the Project. To justify an excused delay in the Contract Time, adverse weather conditions not reasonably anticipated for purposes of Subparagraph 8.3.1 require the presence of abnormally severe or unsafe working conditions on the site that have a material, adverse effect on the scheduled Critical Path Work activities. As a minimum condition for a claim for additional time for abnormally severe weather, the Contractor must provide documentation from National Oceanic and Atmospheric Administration, or other comparable weather agency, that the conditions as the basis for the claim are more severe than for any comparable time period in the vicinity of the site within the past ten years.

...

§ 8.3.3 ~~This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.~~If the delay was caused by any public entity other than the Owner and not caused by the Owner, the Contractor, a Subcontractor of any tier, the Architect, or anyone acting on behalf of one or more of them, the Contractor is entitled only to an increase in the Contract Time (but not a change in the Contract Sum). If the delay was caused by the Contractor, a Subcontractor of any tier, or anyone acting on behalf of one or more of them, the Contractor is not entitled to an increase in the Contract Time or Contract Sum.

...

§ 8.3.4 [Deleted].

...

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. The Owner will make progress payments to the Contractor no more than once each month based on a verified Application for Payment submitted by the Contractor and signed by the Owner.

...

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the ~~Architect,~~ Architect and the Owner, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect and the Owner may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

PAGE 33

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section ~~9.2,~~ 9.2., for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

...

§ 9.3.1.4 The Contractor shall submit its monthly Application for Payment to the Owner and the Architect (if required by the Owner), on AIA Document G702, supported by AIA Document G703, or an equivalent form

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approved by the Owner. Each Application for Payment shall be accompanied by the following, all in form and substance satisfactory to the Owner:

...

.1 Description of the Work.

...

.2 Detailed cost report and updated schedule of values.

...

.3 Separate documentation and accounting for Work performed pursuant to Change Orders, Construction Change Directives, or minor changes in the Work; allowances; application of contingency; and payment for materials stored other than at the Project Site.

...

.4 The Contractor's executed lien, bond, and claim releases ("Lien Releases") on forms acceptable to the Owner. Lien Releases shall provide a conditional release of liens, bonds, and claims for the Work that is subject to the current Application for Payment and an unconditional release for all Work performed through the date of all prior payment periods.

...

.5 All other information and materials required to comply with the requirements of the Contract Documents.

...

The Owner may, at its option, request documentation from the Contractor evidencing that Subcontractors, Sub-subcontractors, and suppliers of every tier have provided the requisite conditional and unconditional releases and waivers of lien and bond rights to the Contractor for each Application of Payment.

...

§ 9.3.2 Unless otherwise expressly provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the Project site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

...

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which ~~Certificates for Payment have been previously issued and payments received from the~~

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~~Owner shall, to the best of the Contractor's knowledge, information and belief,~~ payments have previously been received from the Owner shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

PAGE 34

§ 9.3.4 Retainage will be withheld at a rate of five percent (5%) in accordance with ORS 279C.570.

...

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. ~~The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified.~~ However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

...

.3 failure of the Contractor or Subcontractor to make payments ~~properly~~ to Subcontractors or Sub-subcontractors or for labor, materials or equipment;

...

.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;~~or~~

...

.7 ~~repeated~~ failure to carry out the Work in accordance with the Contract Documents;

...

.8 unsatisfactory Work progress;

...

.9 disputed Work, materials, or products, not to exceed one hundred fifty percent (150%) of the amount in dispute;

...

.10 failure to comply with other material provisions of the Contract Documents;

...

.11 failure to maintain current safety and as-built documents as required by Section 3.11; or

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...

~~the Contract Documents.~~ .12 failure to train personnel on the Project site in required safety procedures as required in the Contract Documents.

...

§ 9.5.2 When the ~~above~~ reasons for withholding certification are removed, certification will be made for amounts previously withheld.

...

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the ~~Architect and the Architect will reflect such payment on the next Certificate for Payment.~~ Architect. The Owner will notify the Contractor of a joint payment, and the Owner will receive credit against the Contract Sum for the joint payment.

PAGE 35

§ 9.5.4 If the Contractor disputes any determination by the Architect with regard to any Certificate of Payment, the Contractor nevertheless shall expeditiously continue the Work.

...

§ 9.7 FAILURE OF PAYMENT

...

§ 9.7.1 If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

...

§ 9.7.2 Failure of payment does not exist under Section 9.7.1 if the Owner exercises authority granted by the Contract documents to withhold payment notwithstanding certification by the Architect.

...

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when (1) the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended ~~use.~~use and (2) the Contractor, its Subcontractors of any tier, and its suppliers of any tier have completed or satisfied all conditions required of the Contractor for the issuance of a temporary or permanent certificate of occupancy.

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.1 As part of the final Application for Payment, the Contractor shall assemble for the Architect's approval within thirty (30) days of Substantial Completion three (3) complete bound copies of all operation, maintenance, and warranty data from all manufacturers whose equipment is installed in the Work. The final Certificate for Payment will not be issued by the Architect until all warranties and guaranties have been received and accepted by the Owner.

...

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Owner or the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

...

§ 9.8.3 Upon receipt of the Contractor's list, the Owner or the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Owner's or Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Owner or the Architect. In such case, the Contractor shall then submit a request for another inspection by the Owner or the Architect to determine Substantial Completion.

...

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list ~~accompanying the Certificate.~~ prepared under this Section 9.8. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

...

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

...

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Owner and the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and ~~Contractor or, if no agreement is reached, by decision of the Architect.~~Contractor.

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...

§ 9.9.4 The Contractor shall deliver to the Owner certificates of inspection, use, and occupancy upon completion of the Work in sufficient time for occupation of the Project in accordance with the approved schedule for the Work. The costs of such procurement, payment, and delivery shall be included within the Contract Sum.

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§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Owner and the Architect will promptly make such inspection and, when ~~the Architect finds~~ the Owner and the Architect find the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract ~~Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable.~~ Documents. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

...

§ 9.10.4 In the event that final completion is not accomplished within 30 days after the date of Substantial Completion due to any fault of the Contractor, the Owner may withhold from any subsequent progress payments and from the final payment 150 percent of the reasonable cost of the unfinished Work necessary to attain final completion. Such funds are to be paid pro rata following successful completion of the unfinished Work if the Work is done by the Contractor. In the event that the Contractor fails to complete the Work necessary to attain final completion, the Owner may, without waiving any other remedies it may have, complete the Work and deduct the actual cost thereof from the funds withheld. The Owner shall not withhold any amount under this section relating to Work arising from Change Orders or Construction Change Directives issued following the date of Substantial Completion.

...

§ 9.10.5 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

...

.2 failure of the Work to comply with the requirements of the Contract Documents;~~or~~

...

.3 terms of ~~special~~ warranties required by ~~the Contract Documents.~~ or included in the Contract Documents; or

...

.4 the correction remedy allowed by Section 12.2.

...

§ ~~9.10.5~~ 9.10.6 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

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§ 9.10.7 Requests for payment will not be considered if submitted (1) more than ninety (90) days following completion of the Work performed or (2) on or after the date of acceptance of final payment, whichever is

...

~~ARTICLE~~ earlier.

...

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

...

§ 10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor acknowledges the unique safety risks associated with construction of school facilities in the presence of faculty, students, staff, and visitors.

...

§ 10.1.2 This Contract incorporates by this reference any Owner's safety policies current as of the date of commencement of the Work, which have been or will be made available to the Contractor. The Contractor, as a condition precedent to commencement of the Work, will instruct all personnel of the Contractor and its Subcontractors, prior to their performing any of the Work, of the elements of these policies with which the personnel will be required to comply. Notwithstanding any other provision of the Contract Documents, the Contractor's (or any Subcontractor's) failure to perform adequate safety training is grounds for the Owner's immediate suspension of the Work at the Contractor's sole expense and may result in cancellation of the Contract.

...

§ 10.1.3 In addition to the policies identified above, the Contractor shall review with all Subcontractors the methods, materials, tools, and equipment to be used to verify their compliance with all safety standards and laws and the Contractor shall be responsible for compliance with them, to ensure safe, hazard-free conditions for all persons visiting or working on the entire Project site and the Owner's adjoining facilities.

...

§ 10.1.4 The Contractor will develop a fire response plan consistent with that of the Owner, which will be strictly enforced by the Contractor's project safety officer and the Owner. The Contractor will supply fire extinguishers in sufficient size and quantity, distributed throughout the Project site, to maintain a safe working environment.

...

§ 10.1.5 The Contractor will ensure that all equipment furnished and installed as part of the Work is rated by Underwriters Laboratories or another method approved by the state testing laboratory or the Owner, as appropriate.

...

§ 10.1.6 Tobacco use is not permitted on any of the Owner's property. The Contractor will publish this standard to all personnel for whom it or its Subcontractors are responsible and will enforce it appropriately.

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...

§ 10.2.1 The Contractor shall take all necessary reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

...

.1 employees on the ~~Work~~ Work, the Owner's faculty, staff, students, and visitors and other persons who may be affected thereby;

...

.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors;~~and~~

...

.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of ~~construction.~~construction; and

...

.4 adjoining operations of the Owner.

...

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including installing fencing and posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities. The Contractor shall also be responsible, subject to the terms of the Contract, for all measures necessary to protect any property adjacent to the Project and improvements therein. Any damage to such property or improvements shall be promptly repaired by the Contractor. Contractor shall provide reasonable fall protection safeguards and provide approved fall protection safety equipment for use by all exposed Contractor employees.

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§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel. The Contractor must obtain advance approval before proceeding with the storage or use of explosives or hazardous materials for performance of the Work.

...

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 ~~and 10.2.1.3 caused in whole or in part~~ through 10.2.143 to the extent caused by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 ~~and 10.2.1.3, except~~ through 10.2.1.4, but not to the extent of damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be ~~liable, and not attributable to the fault or negligence of the Contractor.~~ liable. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

...

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§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent or designated safety officer unless otherwise designated by the Contractor in writing to the Owner and Architect.

...

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition. The Contractor will ensure that storage practices on the Project site will keep combustible load levels at a minimum and in approved containers that are clearly labeled. The Contractor will provide material safety data sheets to the Owner's Representative for all chemicals used on the Project site.

...

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

...

~~If either party suffers injury or damage to person or~~ The Contractor will immediately report to the Owner by telephone or messenger whenever any person at the Project Site suffers injury or if there is property damage to the Owner's existing facilities or adjoining property. The notice shall provide sufficient detail to enable the other party to investigate the matter. The Contractor will promptly follow up the notice with a written report to the Owner.

...

~~property because of an act or omission~~ **§ 10.2.9** Without limiting any other requirement of this Section 10.2, the Contractor shall protect adjoining property and shall provide barricades, temporary fences, and covered walkways to protect the safety of passersby, as required by prudent construction practices, laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, or the Contract Documents. The Contractor shall be responsible for all measures necessary to protect any property adjacent to the Project and improvements thereon.

...

~~of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given~~ **§ 10.2.10** Without limiting any other requirement of this Section 10.2, the Contractor shall, at its sole cost and expense, promptly repair any damage or disturbance to walls, utilities, sidewalks, curbs, adjoining property, and the property of third parties (including utility companies and governments) resulting from the performance of the Work, whether caused by the Contractor or by its Subcontractors of any tier. The Contractor shall maintain streets in good repair and traversable condition.

...

~~to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the~~ **§ 10.2.11** The Contractor will ensure that storage practices on the Project site will keep combustible load levels to a minimum and in approved containers that are clearly labeled. The Contractor will provide material safety data sheets to the Owner for all chemicals used on the Project Site.

...

~~other party to investigate the matter.~~ **§ 10.2.12** Without limiting any other requirement of this Section 10.2, the Contractor shall maintain Work, materials, and apparatus free from damage from rain, wind, storms, frost, and heat. If adverse weather makes it impossible to continue operations safely in spite of weather precautions, the Contractor shall cease Work and notify the Owner and the Architect of the cessation.

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...

§ 10.2.13 The Contractor shall not permit open fires on the Project Site.

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§ 10.3.1 ~~The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters~~ Hazardous Materials as that term is defined under Section 10.3.6. With respect to Hazardous Materials to be used during the course of the Work, the Contractor will implement and enforce a program to inventory and properly store and secure all Hazardous Materials that may be used or present on the Project site, maintain available for inspection at the Project site all material safety data sheets, and comply with all regulations required by law for the storage, use, and disposal of Hazardous Materials. The program must provide for notification of all personnel of potential chemical hazards. Review of these hazards must be included in the Contractor's safety training program. The Contractor shall submit to the Owner a list of all Hazardous Materials to be brought by the Contractor or its Subcontractors onto the Owner's property, including the purpose for their use on the Project.

...

~~a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.~~ § 10.3.2 In the event of a release or discovery of a preexisting release of Hazardous Materials, or if it is foreseeable that injury or death to persons may occur because of any material or substance (including without limitation Hazardous Materials) encountered on the Project site , the Contractor shall promptly (1) stop the Work or the portion of the Work affected, (2) notify the Owner and the Architect orally and in writing, and (3) protect against exposure of persons to the Hazardous Materials. The Contractor shall provide all written warnings, notices, reports, or postings required at law or by contract for the existence, use, release, or discovery of Hazardous Materials.

...

§ ~~10.3.2 Upon receipt of the Contractor's written notice,~~ 10.3.3 With respect to any Hazardous Materials or other material or substance reported to the Owner under Section 10.3.2 that was not introduced to the Project site by the Contractor or its Subcontractors of any tier, the Owner shall obtain the services of a ~~licensed laboratory~~ qualified environmental consultant to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to ~~cause~~ verify it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time ~~shall~~ may, subject to agreement by the Owner and the Contractor, be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and ~~start-up.~~start-up, which adjustments shall be accomplished as provided in Article 7.

...

§ 10.3.3.1 With respect to any Hazardous Materials or other material or substance reported to the Owner under Section 10.3.2 that was introduced to the Project site by the Contractor or its Subcontractors of any tier, the

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Contractor shall be responsible to carry out the duties of (1) proposing to the Owner and the Architect a qualified environmental consultant, (2) obtaining and paying for the services of the environmental consultant, and (3) verifying that the material is rendered harmless, as otherwise set forth in Section 10.3.3. The Contractor will not be entitled to an increase in the Contract Sum as stated in the last sentence of Section 10.3.3 if the Contractor or its Subcontractors of any tier are responsible for the condition requiring the testing of the material and the stoppage of the Work. Remediation work must be conducted by properly qualified contractors approved in advance by the Owner. Generally, the Owner may at its option contract directly with environmental consultants, and remediation contractors, regardless of whether the work will be performed at the Contractor's expense.

...

§ 10.3.4 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including ~~but not limited to attorneys'~~ without limitation attorney fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance was not introduced to the Project site by the Contractor or its Subcontractors of any tier, presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered ~~harmless,~~ harmless.

...

~~provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.~~ No indemnification provided by the Owner under this Section 10.3.4 will be required to indemnify the Contractor, Subcontractors, or their employees or agents to the extent of

...

~~**§ 10.3.4** The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.~~liability for death or bodily injury to persons or damage to property caused in whole or in part by the Contractor's own negligence, but will require indemnity to the extent of the fault of the Owner or its agents or representatives.

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§ 10.3.5 ~~The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.~~To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, the Owner's Representatives, and employees of any of them from and against claims, damages, losses, and expenses, including without limitation to attorney fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance was introduced to the Project site by the Contractor or its Subcontractors of any tier, presents the risk of bodily injury or death, and has not been rendered harmless. No indemnification provided by the Contractor under this Section 10.3.5 will be required to indemnify the Owner or its agents or representatives to the extent of liability for death or bodily injury to persons or damage to property caused in whole or in part by the Owner's own negligence, but will require indemnity to the extent of the fault of the Owner or its agents or representatives.

...

§ 10.3.6 ~~If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the~~

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~~Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.~~"Hazardous Materials" are any substance defined or designated as being radioactive, infectious, hazardous, dangerous, or toxic by any federal, state, or local statute, regulation, or ordinance presently in effect or subsequently enacted. For purposes of Section 10.3, the term "introduce" means the physical placement or transportation of Hazardous Materials in or on the Project site regardless of whether the Hazardous Material was specified, required, or otherwise addressed in the Contract Documents.

...

In an emergency affecting safety of persons or property, the Contractor shall ~~act, at the Contractor's discretion,~~ act to prevent threatened damage, injury or ~~loss.~~ loss and immediately notify the Owner. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

...

.4 Claims for damages insured by usual personal injury liability ~~coverage;~~coverage and commercial general liability coverage (or its equivalent as approved in advance by the Owner);

...

.7 Claims for bodily injury or property damage arising out of completed operations;~~and~~

...

.8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section ~~3.18.~~3.18;

...

.9 claims for third-party injury and property damage (including without limitation clean-up costs) as a result of pollution conditions arising from the Contractor's operations or completed operations; and

...

.10 claims involving the Contractor's professional liability, solely to the extent that the Contractor accepts design or design/build responsibilities under this Contract.

...

Contractor with prior approval from the Owner, may provide a Contractor Controlled Insurance Program (CCIP), which will include commercial general liability and excess liability and employers liability for the benefit of the Owner and all additional insureds required by Owner, however, nothing herein shall obligate Contractor to provide professional liability coverage under the CCIP or to provide coverage to the Owner, additional insureds, A/E, its subconsultants, or enrolled subcontractors of every tier who perform the Work at or from the designated Project site for claims arising from the design of the project which coverages are expressly excluded from the CCIP policies.

...

§ 11.1.2 ~~The~~ CONTRACTOR PROVIDING INSURANCE

...

Without waiver of any other requirement of Section 11.1, the Contractor will pay for and maintain the following

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insurance at all times during the performance of the Work, without interruption until final acceptance of the Work or for such further duration as required below. All of the Contractor's insurance carriers shall be rated A VII or better by A.M. Best's rating service, unless otherwise approved by the Owner.

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.1 Workers' Compensation. The Contractor shall purchase and maintain workers' compensation coverage sufficient to meet statutory liability limits.

...

~~Section 11.1.1~~ **.2 Employer's Liability.** The Contractor shall purchase and maintain employer's liability insurance in addition to its workers' compensation coverage with at least the minimum limits listed in Section 11.1.3 of these General Conditions.

...

~~shall be written for not less than limits of liability specified in~~ **.3 Commercial General Liability.** The Contractor shall purchase and maintain commercial general liability ("CGL") insurance on an occurrence basis, written on ISO Form CG 00 01 (12 04 or later) or an equivalent form approved in advance by the Owner. CGL coverage shall include all major coverage categories, including bodily injury, property damage, and products/completed operations coverage maintained for at least six (6) years following Final Payment. The CGL insurance must also include the following: (1) separation of insureds and (2) per-project aggregate.

...

.4 Professional Liability. To the extent that the Contract Documents ~~or required~~ require the Contractor to provide professional design services or certifications related to systems, materials, or equipment, the Contractor shall (1) purchase and maintain professional liability/errors-and-omissions insurance and (2) cause those Subcontractors providing professional design services or certifications related to systems, materials, or equipment to do so under the requirements of Sections 5.5 and 11.1.3.

...

~~by law, whichever coverage~~ **.5 Automobile Liability.** The Contractor shall purchase and maintain automobile liability insurance with coverage for owned, hired, and nonowned vehicles on ISO Form CA 00 01 or an equivalent form approved in advance by the Owner. The automobile liability insurance shall include pollution liability coverage with vehicle overturn and collision.

...

~~is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination~~ **.6 Pollution Liability.** If the Owner designates the Project as having a known pollution exposure, the Contractor shall purchase Contractors Pollution Liability ("CPL") insurance. If the CPL insurance is written on a claims-made basis rather than an occurrence basis, then coverage must be maintained for at least six (6) years following final payment. Coverage is to include third-party claims for bodily injury, property damage, and environmental damage resulting from pollution conditions caused during the performance of covered operations both on site and migrating from the jobsite. Coverage is also to include pollution conditions arising from covered operations, including

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work performed by the Contractor's Subcontractors and third-party claims against the Contractor alleging improper supervision of the Subcontractors. The Contractor shall arrange for, and be responsible for, the selection of Subcontractors used to transport all Hazardous Materials that leave the Project site.

...

~~of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until~~ .7 **Commercial Umbrella/Excess Coverage.** The Contractor shall purchase or maintain commercial umbrella or excess liability insurance to meet the minimum limits as described below in Section 11.1.3. Commercial umbrella/excess liability coverage includes: (1) "Pay on behalf of" wording; (2) concurrency of effective dates with primary coverage; (3) punitive damages coverage (if not prohibited by law); (4) application of aggregate (when applicable) in primary coverage; and (5) drop-down feature. The third-party liability insurance shall be scheduled to the umbrella/excess coverage.

...

~~the expiration of~~ **§ 11.1.3 Limits.** The insurance required by Section 11.1 shall be written for at least the limits of liability specified in this Section or required by law, whichever is greatest.

...

.1 **Workers' Compensation.** Statutory Limits

...

.2 **Employer's Liability.**

...

Each Accident: $ 1,000,000

...

Each Bodily Injury Disease: $ 1,000,000

...

Aggregate Bodily Injury Disease: $ 1,000,000

...

.3 **Commercial General Liability.**

...

Each Occurrence: $ 2,000,000

...

General Aggregate: $ 3,000,000

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...

Product/Completed Operations: $ 3,000,000

...

Personal & Advertising Injury: $ 2,000,000

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.4 Professional Liability/E&O.

...

Each Claim/Aggregate: $ 2,000,000

...

.5 Automobile Liability.

...

Combined Single Limit: $ 1,000,000

...

.6 Pollution Liability.

...

Single Limit: $ 50,000,000

...

Aggregate: $ 50,000,000

...

.7 Commercial Umbrella/Excess Coverage.

...

Each Occurrence: $ 20,000,000

...

~~the period for correction of Work or~~ **§ 11.1.4 Additional Insureds.** The Contractor's third-party liability insurance policies shall include the Owner and its officers, employees, agents, volunteers, partners, successors, and assigns as additional insureds. The policy endorsement must extend premise operations and products/completed operations to the additional insureds. The additional insured endorsement for the Commercial General Liability must be written

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on ISO Form CG 2010 (11/85), a CG 2037 (07/04) together with CG 2033 (07/04), or the equivalent; but shall not use the following forms: CG 20 10 (10 93) or CG 20 10 (03 94).

...

~~for such other period for maintenance of completed operations coverage as specified in the Contract Documents.~~ **§ 11.1.5 Joint Venture.** If the Contractor is a joint venture, the joint venture shall be a *named* insured for the liability insurance policies.

...

§ 11.1.3 ~~Certificates of insurance acceptable to the Owner shall be filed with the Owner prior~~ **11.1.6 Primary Coverage.** The Contractor's insurance identified in Section 11.1 shall be primary insurance coverage and may not seek contribution from any insurance or self-insurance carried by the Owner including any property damage coverage carried by the Owner. Contractor's insurance shall apply separately to each insured against whom a claim is made or suit is brought. The Contractor's insurance shall not include any cross-suit exclusion or preclude an additional insured party from asserting a claim as a third party. The Contractor waives all rights of subrogation against the Owner and coverage that the Owner maintains.

...

~~to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies~~ **§ 11.1.7 Contractor's Failure to Maintain Insurance.** If the Contractor for any reason fails to maintain required insurance coverage, such failure shall be deemed a material breach of the Contract and the Owner, at its sole discretion, may suspend or terminate the Contract pursuant to Section 14.2. The Owner may, but has no obligation to, purchase such required insurance and without further notice to the Contractor, the Owner may deduct from the Contract Sum any premium costs advanced by the Owner for such insurance. Failure to maintain the insurance coverage required by this Section 11.1 shall ~~contain a provision~~ not waive the Contractor's obligations to the Owner.

...

.1 The Contractor shall notify the Owner in writing at least thirty (30) days before any cancellation, lapse, or expiration of any insurance required by this Article 11.

...

~~that coverages afforded under the policies will not be canceled or allowed~~ .2 The Contractor shall notify the Owner in writing of any reduction in available insurance coverage, including without limitation revised coverage limits or claims paid under the general aggregate, or both, that would cause the insurance available to the Owner to fall below or outside the requirements set forth in this Article 11 or by law.

...

~~to expire until at least 30 days' prior written notice has been given to the Owner. An~~ **§ 11.1.8 Certificates of Insurance.** Before commencing the Work, the Contractor shall supply to the Owner certificates of insurance for the insurance policies described in this Section 11.1 prior to the commencement of the Work and before bringing any equipment or construction personnel onto the Project site.

...

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~~additional certificate evidencing continuation of liability coverage, including coverage for completed operations,~~ **.1 Additional Certificates.** To the extent that the Contractor's insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment as required by Section ~~9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2.~~ 9.10.2. Information concerning reduction of coverage on account of revised limits or claims paid under the ~~General Aggregate,~~ general aggregate, or both, shall be furnished by the Contractor with reasonable ~~promptness.~~promptness in accordance with the Contractor's information and belief.

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.2 Prohibition Until Certificates Received. The Owner may, but is not obligated to, prohibit the Contractor and its Subcontractors from entering the Project site until the required insurance certificates and all required attachments have been received and approved by the Owner. The Contractor may not enter the Project site or commence the Work until the Contractor places for the Work all coverages required under Section 11.1.2.

...

§ ~~11.1.4 The Contractor shall cause the~~ ~~commercial liability~~ **~~coverage required by the~~** ~~Contract Documents~~ **11.1.9 Subcontractor Insurance. The Contractor shall cause each Subcontractor to purchase and maintain in full force and effect policies of insurance as specified in this Section 11.1, except for coverage limits, which will be agreed upon between the Owner and the Contractor. The Contractor will be responsible for the Subcontractors' coverage if the Subcontractors fail to purchase and maintain the required insurance. When requested by the Owner, the Contractor will furnish copies of certificates of insurance establishing coverage for each Subcontractor.**

...

§ 11.1.10 Limitations on Coverage.

...

~~to include (1) the Owner, the Architect and the Architect's consultants as additional insureds for claims~~

.1 No insurance provided by the Contractor under this Section 11.1 will be required to indemnify the Owner, the Architect, or their employees or agents to the extent of liability for death or bodily injury to persons or damage to property caused in whole or in part by ~~the Contractor's negligent acts~~ their own negligence, but will require indemnity to the extent of the fault of the Contractor or its agents, representatives, or Subcontractors.

...

.2 The obligations of the Contractor under this Section 11.1 shall not extend to the liability of the Architect or its consultants for (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs, or specifications, or (2) the giving or failure to give directions or instructions, to the extent that the directions, or failure to provide directions, are the cause of the injury or damage.

...

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~~or~~ omissions during ~~the~~ Contractor's operations; ~~and~~ (2) ~~the Owner~~ as an additional insured ~~for claims caused in whole~~ .3 **By requiring insurance, the Owner does not represent that coverage and limits will necessarily be adequate to protect the Contractor. Insurance in effect or procured by the Contractor will not reduce or limit the Contractor's contractual obligations to indemnify and defend the Owner for claims or suits that result from or are connected with the performance of the Contract.**

...

~~or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.~~ **§ 11.1.11 DEDUCTIBLES/SELF-INSURED RETENTIONS** Payment of deductibles or self-insured retentions is not a Cost of the Work within the Contract Sum or the Guaranteed Maximum Price and does not justify a Change Order. **Satisfaction of all self-insured retentions or deductibles is the sole responsibility of the Contractor.**

...

The Owner shall be responsible for ~~purchasing and~~ maintaining the Owner's usual liability insurance.

...

§ 11.3.1 Unless otherwise provided, the ~~Owner~~ Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

PAGE 45

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, ~~earthquake,~~ earth movement, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for ~~Architect's~~ Architect's, Owner's, and Contractor's services and expenses required as a result of such insured loss.

...

§ 11.3.1.2 ~~If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.~~

...

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§ 11.3.1.3 If the property insurance requires deductibles, the ~~Owner~~ Contractor shall pay costs not covered because of such deductibles.

...

The Owner shall ~~purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.~~maintain boiler and machinery insurance.

...

§ 11.3.3 ~~LOSS OF USE INSURANCE~~[Deleted]

...

~~The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.~~

...

§ 11.3.4 ~~If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.~~**[Deleted]**

...

§ 11.3.5 ~~If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.~~**[Deleted]**

...

§ 11.3.6 ~~Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.~~

...

[Deleted]

...

§ 11.3.7 ~~WAIVERS OF SUBROGATION~~[Deleted]

...

~~The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate~~

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~~contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.~~

...

§ 11.3.8 A loss insured under the ~~Owner's~~ Contractor's property insurance shall be adjusted by the ~~Owner as fiduciary~~ Contractor and made payable to the ~~Owner as fiduciary~~ Contractor for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

...

§ 11.3.9 If required in writing by a party in interest, the ~~Owner as fiduciary~~ Contractor shall, upon occurrence of an insured loss, give bond for proper performance of the ~~Owner's~~ Contractor's duties. The cost of required bonds shall be charged against proceeds ~~received as fiduciary. The Owner~~ received. The Contractor shall deposit in a separate account proceeds so received, which the ~~Owner~~ Contractor shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

...

§ 11.3.10 The ~~Owner as fiduciary~~ Contractor shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the ~~Owner's~~ Contractor's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the ~~Owner as fiduciary~~ Contractor shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

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§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Guaranteed Maximum Price Amendment or Early Work Amendment, if any, as required by the Contract.

...

§ 11.4.3 The Contractor may require one or more Subcontractor(s) to furnish payment and performance bonds covering the faithful performance of the particular subcontract, purchase order or similar agreement and the payment of obligations arising there under. In the event such bonds are furnished pursuant to this Subparagraph, the Owner shall pay the Contractor the cost of such bonds as part of the Cost of the Work, subject to the Guaranteed Maximum Price. Upon written approval from the Owner, Contractor may elect to provide Subcontractor default

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insurance (SDI) in lieu of performance and payment bonds for Subcontractors. Such subcontractor default insurance (SDI) shall provide coverage against losses directly caused by the default of performance or payment of a subcontractor under the terms and conditions of its subcontract. SDI shall be considered as part of the Cost of the Work, subject to the Guaranteed Maximum Price.

...

§ 12.1.1 If a portion of the Work is covered contrary to the Owner's or the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by ~~the Architect, be uncovered for the Architect's examination~~ the Owner or the Architect, be uncovered for examination by the Owner, the Architect, or any governmental authority and be replaced at the Contractor's expense without change in the Contract Time.

...

§ 12.1.2 If a portion of the Work has been covered that the Owner and the Architect or any governmental authority has not specifically requested to examine prior to its being covered, the Owner or the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of uncovering and correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

...

The Contractor shall promptly correct Work rejected by the ~~Architect~~ Owner, the Architect, or any governmental authority or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Owner's and the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

...

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly ~~after receipt of written~~ for no additional compensation after notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. ~~During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty.~~ If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

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§ 12.2.2.3 The one-year period for correction of Work shall ~~not~~ be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

...

§ 12.2.3 The ~~Contractor~~ Contractor, at its expense, shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

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...

The Contract shall be governed by the law of the place where the Project is ~~located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.~~located.

...

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole or in part without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

...

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by ~~registered or~~ certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

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§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals ~~with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give~~ by public agencies or by independent testing laboratories, as may be required by the Owner or the permitting jurisdiction. The Owner shall retain and pay for any private inspectors or testing laboratories that are required. The costs of such private inspections and tests shall not be included in the Contract Sum. The Contractor shall forward to the Architect and the Owner copies of all inspections, results, test results, orders, permits, and other directives or correspondence received by the Contractor from any inspector, testing laboratory, or agency with jurisdiction over the Work. The Contractor shall give the Owner and the Architect timely notice of when and where tests and inspections are to be made so that the Owner and the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

...

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, ~~inspection~~ inspection, or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Owner and the Architect of when and where tests and inspections are to be made so that the Owner and the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

...

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Owner's and the Architect's services and expenses shall be at the Contractor's ~~expense.~~expense, including without limitation the cost of retesting for verification of compliance, if necessary, until the Architect certifies that the Work in question does comply with the requirements of the Contract Documents.

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...

§ 13.5.7 No inspection performed or failed to be performed by the Owner shall waive any of the Contractor's obligations or be construed as an approval or acceptance of the Work or any part thereof.

...

Payments due and unpaid under the Contract Documents shall bear interest ~~from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.~~at an annual rate of one percent (1.0%) over the prime lending rate published by the *Wall Street Journal*.

...

The Owner and Contractor shall commence all claims and causes of action, whether ~~in~~ based on contract, tort, breach of ~~warranty~~ warranty, statute, or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable ~~law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.~~law.

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§ 14.1.2 The Contractor may terminate the Contract if, ~~through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays~~ (1) repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is ~~less.~~less, and (2) none of the repeated suspensions, delays, or interruptions of the entire Work are caused by act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or any of their respective agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor.

...

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such ~~termination, and damages.~~termination.

...

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;~~or~~

...

.4 otherwise is guilty of substantial breach of a provision of the Contract ~~Documents.~~Documents; or

...

.5 fails to observe the training, safety, and other precautions required in Article 10, including the Contractor's own safety policies for the Project.

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...

§ 14.2.2 When any of the above reasons exist, the ~~Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action,~~ Owner may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate ~~employment of the Contractor~~ the Contract and may, subject to any prior rights of the surety:

...

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Owner's and the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the ~~Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this~~ Owner.. This obligation for payment shall survive termination of the Contract.

...

§ 14.2.5 If termination for cause is determined later to have been wrongful or without justification, then the termination will be considered to have been termination for convenience.

PAGE 50

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the ~~extent~~extent:

...

§ 14.4.2 Upon receipt of written notice from the Owner of ~~such~~ termination for the Owner's convenience, the Contractor ~~shall~~shall:

...

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work executed. The Contractor hereby waives and forfeits all other claims for payment and damages, including without limitation anticipated profits.

...

~~not executed.~~**§ 14.4.4** The Owner may terminate a portion of the Work for the Owner's convenience and without cause, in which case the provisions of this Section 14.4 shall apply only to the portion of the Work terminated and the Contractor shall continue with performance of the remaining Work that is not terminated.

...

Claims by either the Owner or Contractor must be ~~initiated~~ made by written notice to the other party and ~~to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker.~~ the Architect. Claims by either party must be ~~initiated~~ made within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is ~~later.~~ later, and must identify the known bases for each Claim and the nature and amount of the relief sought.

...

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Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. ~~The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.~~

...

If the Contractor wishes to make a Claim for an increase in the Contract ~~Sum,~~ Sum or Guaranteed Maximum Price, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4. Failure to provide timely notice in accordance with Section 15.1.2 constitutes waiver of the Claim.

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§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary. Claims for additional time are governed by Section 8.3. Failure to provide timely notice in accordance with Section 15.1.2 constitutes waiver of the Claim.

...

§ 15.1.6 ~~CLAIMS FOR CONSEQUENTIAL DAMAGES~~[Deleted]

...

~~The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes~~

...

§ 15.2 INITIAL RESOLUTION

...

~~.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons;~~ **§ 15.2.1** To facilitate the resolution of Claims between the Contractor and

...

~~.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.~~the Owner, the parties shall attempt in good faith first to resolve Claims that are made before Final Payment by the

...

~~This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.~~following dispute-resolution process. The parties agree not to proceed to arbitration until the following process has been attempted. Neither party's rights, defenses, Claims, and remedies shall be considered waived, released, or adversely

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affected by its participation in this process, but this process shall not toll any applicable statutory periods of limitation, duration, or ultimate repose except to the extent that the parties separately agree in writing to toll those periods.

...

~~§ 15.2 INITIAL DECISION~~

...

~~§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.~~**.1** All reasonable efforts will be made by the Owner's Representative and the Contractor's project manager to resolve any Claims that arise during the Work in a prompt and equitable manner. If they fail to reach an equitable agreement to resolve a Claim, either party may notify the other party in writing to identify the Claim with known specificity and request a meeting between the Owner's senior executive responsible for the Project and the Contractor's senior executive responsible for the Project.

...

~~§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the~~ **.2** The parties' senior executives shall meet at a mutually agreed time and place within ten (10) days of receipt of the written notice and attempt in good faith to negotiate a resolution of the Claim. If within ten (10) days after the meeting the parties have not succeeded in negotiating an agreed-upon resolution of the Claim, then either party may pursue any and all rights and remedies available to it in the Agreement.

...

~~parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.~~**.3** The parties may at any time mutually agree to submit any dispute between them to voluntary mediation or to arbitration under Section 15.4.

...

§ 15.2.2 [Deleted].

...

~~§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.~~[Deleted].

...

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§ 15.2.4 ~~If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.~~[Deleted].

...

§ 15.2.5 ~~The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.~~[Deleted].

...

§ 15.2.6 ~~Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.~~

...

[Deleted]

...

§ 15.2.6.1 ~~Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.~~ **[Deleted]**

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§ 15.2.8 If a Claim relates to or is the subject of a ~~mechanic's~~ materialman's lien or construction lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

...

§ 15.3.1 ~~Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.~~**[Deleted]**

...

§ 15.3.2 The parties ~~shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.~~may agree to engage in mediation to resolve their Claims.

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...

§ 15.3.3 ~~The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.~~ **[Deleted]**

...

§ 15.4.1 ~~If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation~~ Every Claim shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the ~~American Arbitration Association~~ Arbitration Service of Portland, Inc., in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the ~~person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.~~ Arbitration Service of Portland, Inc., unless the parties elect another person or entity to administer arbitration proceedings. Exclusive venue for arbitration shall be Clatsop County, Oregon.

...

§ 15.4.1.1 A demand for arbitration shall be ~~made no earlier than concurrently with the filing of a request for mediation,~~ delivered in writing to the other party within a reasonable time after the claim, dispute or other matters in question have arisen, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations or repose purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

...

§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) ~~the arbitration agreement governing the other arbitration permits consolidation, (2)~~ the arbitrations to be consolidated substantially involve common questions of law or fact, and ~~(3)~~ (2) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

...

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in ~~arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.~~arbitration.

...

§ 15.4.4.4. Prior to allowing any subcontractor or other party retained by the Contractor to commence work on the Project, the Contractor shall require such third party to consent in writing to arbitration if requested by the Owner or the Contractor.

...

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END OF THE GENERAL CONDITIONS

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Certification of Document's Authenticity

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I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 13:08:20 on 03/28/2018 under Order No. 3771640865 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ - 2007, General Conditions of the Contract for Construction, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

(Signed)

_____

(Title)

_____

(Dated)

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DOCUMENT 00 73 40
PUBLIC CONTRACTING

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Prevailing Wage Requirements (PWR) - ORS 279C.830 to .870.

B. Prevailing Wage Rate Fee - BOLI - ORS 279C.825.

C. Public Works Bond (Contractors) - BOLI - ORS 279C.830(2)(a).

D. Public Works Bond (Subcontractors) - BOLI - ORS 279C.830(2)(b).

E. Certified statements - ORS 279C.845.

F. Withholdings for lack of payment - ORS 279C.515.

G. Written notice of working hours - ORS 279C.520.

H. Payment for medical services - ORS 279C.530.

I. Ineligible to hold public works contracts - ORS 279C.860.

J. Registration with Oregon Construction Contractors Board - ORS 701.021.

K. Payment for daily, weekly, weekend, and holiday overtime - ORS 279C.540.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. None

1.03 PREVAILING WAGE REQUIREMENTS (PWR) - ORS 279C.830 TO .870

A. The Work described in the Contract Documents is subject to State of Oregon Prevailing Wage Rates in effect at the time the project is first advertised in accordance with ORS 279C.800-870. Ensure all workers are paid in accordance with applicable wage rates and be solely responsible for unpaid prevailing wages.

B. The applicable prevailing wage rates in effect at the time the bid specifications are first advertised, including the following:
   1. Prevailing Wage Rates for Public Works Contracts in Oregon.
   2. PWR Amendments, as applicable.
   3. State Prevailing Wage Apprenticeship Rates.
   4. Definitions of Covered Occupations for Public Works Contracts in Oregon.

C. Current rates can be found at the following location:
   1. http://www.oregon.gov/boli/WHD/PWR/Pages/pwr_oregon_2018.aspx.

1.04 PREVAILING WAGE RATE FEE - ORS 279C.825

A. Owner shall pay the prevailing wage rate fee required to be paid to the Commissioner of the Bureau of Labor and Industries as provided in ORS 279C.825.

1.05 PUBLIC WORKS BONDS (CONTRACTORS) - ORS 279C.830(2)(A)

A. Contractor must have a public works bond filed with the Construction Contractors Board before starting work on the project, unless exempt under ORS 279C.836 (4), (7), (8) or (9).

1.06 PUBLIC WORKS BONDS (SUBCONTRACTORS) - ORS 279C.830(2)(B)

A. Include in every subcontract a provision requiring the subcontractor to have a public works bond filed with the Construction Contractors Board before starting work on the project, unless exempt under ORS 279C.836 (4), (7), (8) or (9).

1.07 CERTIFIED STATEMENTS - ORS 279.845

A. The contractor or the contractor's surety and every subcontractor or the subcontractor's surety shall file certified statements with the public agency in writing in accordance with ORS 279.845.

1.08 WITHHOLDING FOR LACK OF PAYMENT - ORS 279C.515

A. Should the Contractor fail, neglect or refuse to make prompt payment of any claim for labor or services furnished to the Contractor or a Subcontractor by any person in connection with the Work as the claim becomes due, the Owner may pay such claim to the person furnishing the labor or services and charge the amount of the payment against funds due or to become due the Contractor.

1.09 WRITTEN NOTICE OF WORKING HOURS - ORS 279C.520

A. Include in every subcontract that a person may not be employed for more than 10 hours in any one day, or 40 hours in any one week, except in cases of necessity, emergency or when the public policy absolutely requires it (in which case the employee shall be paid at least time and a half pay) unless otherwise permitted by law.

1.10 PAYMENT FOR MEDICAL SERVICES - ORS 279C.530

A. Promptly, as due, make payment to any person, co-partnership, association or corporation furnishing medical, surgical and hospital care services or other needed care and attention, incident to sickness or injury, to the employees of the contractor, of all sums that the contractor agrees to pay for the services and all moneys and sums that the contractor collected or deducted from the wages of employees under any law, contract or agreement for the purpose of providing or paying for the services.

B. Ensure all subject employers working on the Project are either employers that will comply with ORS 656.017 or employers that are exempt under ORS 656.126.

1.11 INELIGIBLE TO HOLD PUBLIC WORKS CONTRACTS - ORS 279C.860

A. Contractor shall not be disbarred from holding public works contracts in the State of Oregon in accordance with ORS 279C.860.

1.12 REGISTRATION WITH OREGON CONSTRUCTION CONTRACTORS BOARD - ORS 701.021

A. Contractor must be registered with the State of Oregon Construction Contractors Board, pursuant to ORS 701.021.

1.13 PAYMENT FOR DAILY, WEEKLY, WEEKEND AND HOLIDAY OVERTIME - ORS 279C.540; ORS 279C.520(1); OAR 839-025-0020(2)(B)

A. Contractor must pay daily, weekly, weekend and holiday overtime as required by ORS 279C.540, ORS 279C.520(1); OAR 839-025-0020(2)(b).

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF DOCUMENT

SECTION 01 10 00
SUMMARY

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. General Requirements.

B. Work Covered by Contract Documents.

C. Contractor Use of Premises.

1.02 GENERAL REQUIREMENTS

A. TIME OF COMPLETION
   1. The work of this Contract shall be commenced on the date of written notice to proceed and shall be completed by the dates established in the Owner/Contractor Agreement, and as stipulated in the General Conditions of the Contract for Construction.

B. LIQUIDATED DAMAGES
   1. The Contractor acknowledges and agrees to abide by all provisions of the General Conditions of the Contract regarding Liquidated Damages as it pertains to all work under this Contract.

C. ASBESTOS FREE CERTIFICATION
   1. Absolutely no materials containing asbestos are to be furnished or installed as part of this Project. Ensure that no subcontractor or any of the Contractor's own forces installs any materials containing asbestos. At final closeout of the Project, provide to the Owner certification that no materials containing asbestos have been installed in the Project, and that the Project is asbestos-free as required by the State of Oregon.

D. COORDINATION
   1. The Contractor is responsible for overall coordination of the Project.
   2. The Drawings and Specifications are arranged for convenience only and do not necessarily determine which trades perform the various portions of the Work.
   3. Coordinate sequence of work to accommodate agreed-upon Owner occupancy.
   4. Perform all necessary work to receive and/or join the work of all trades.
   5. Verify location of existing utilities and protect from damage.

E. PERMITS AND FEES
   1. The Owner will be responsible for filing and paying for building permits and all fees associated with the building permit, system development charges, impact fees, etc. The Contractor will be responsible for picking up all Project permits and will have full responsibility for requirements of and payments for all trade permits (i.e. electrical, plumbing, mechanical).

F. REQUIREMENTS FOR CONTRACTOR, SUBCONTRACTORS, AND MATERIAL SUPPLIERS
   1. Ensure that all persons performing the Work comply with Owner's tobacco policy. Copies made available upon request.
   2. Contractor and Subcontractors shall refrain from contact with staff and students at all times.
   3. Neither the Contractor nor any of its Subcontractors of any tier shall utilize any employee at the site who has pled guilty to or been convicted of any felony crime involving the physical neglect of a child, physical injury to or death of a child, sexual offenses against or sexual exploitation of a child, child prostitution, or other similar offenses as defined by the most current State Statutes, or similar laws of another jurisdiction. Remove from the work and work site any employee who has engaged in such actions, or who the Owner reasonably considers objectionable.
   4. Without limiting the generality of the foregoing, ensure by appropriate provision in each subcontract agreement that the Contractor may remove from the work and work site any Subcontractor or Subcontractor's employee who has engaged in such action. At no

change to the Contract Sum or Contract Time, remove from the work and work site any employee or other person pursuant to this Section. Failure to comply with these requirements is grounds for immediate termination of the Agreement for cause.

1.03 WORK COVERED BY CONTRACT DOCUMENTS

A. Work of this Contract comprises all required general construction, mechanical, plumbing, electrical, and data and technology work related to foundation and slab-on-grade construction for the Seaside New Middle School/High School Bid Package 2 Project located at 2000 Spruce Drive, Seaside, OR 97138.

1.04 CONTRACTOR USE OF PREMISES

A. Work Sequence:
   1. Perform Work in a manner required to accommodate School District use of premises during the Contract Period. Coordinate Work schedules and operations with Owner's use requirements.
   2. Provide access to and from site as required by law and by Owner:
      a. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   3. Do not obstruct roadways, sidewalks, or other public ways without permit.

B. Limitations on Use:
   1. Owner intends to occupy and conduct school in the adjacent existing building during portions of the construction period. The existing building during times of Owner occupancy is a limited Contractor access area. Coordinate access to the existing building.
   2. Complete and exclusive use of the construction area except as outlined above will be permitted from Notice to Proceed until Substantial Completion of the Project. Coordinate areas available for early occupancy (if any) with Owner.
   3. During times of Owner's occupancy there may be down days during the Contract Period when occupied areas will be closed. Request from the District a list of down days that may occur during the Contract Period. Notify the District at least 48 hours in advance of down days during which time the Contractor intends to work. The District will pay for employee time during such down days when the building is required to be open for Contractor use.
   4. Smoking or open fires will not be permitted within the building enclosure or on the premises.
   5. Do not encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated or coordinated with Owner.
   6. Move any stored products under Contractor's control which interfere with operations of Owner or separate contractors.

C. Contractor's Site Conduct:
   1. Identifying name tags will be worn at all times.
   2. No loitering in the school buildings or unsupervised/unauthorized entry.
   3. Site is tobacco-free. This means no smoking or chewing on any school property.
   4. Beyond courtesy, there should be no interaction between staff and faculty.
   5. Keep project free of pop cans, lunch wrappers and similar debris.
   6. Review with the Owner the scheduling of any work that is excessively noisy or has the potential to disrupt activities of Owner or neighbors.
   7. Be considerate of the client, the students and faculty.
   8. Always consider, prior to an act, the safety of students, faculty and other co-workers.
   9. Profanity is not acceptable.
   10. The wearing of clothing with logos displaying alcohol, tobacco, illegal substances or suggestive themes is not acceptable attire.

D. Non-Interference with School:
   1. Perform work operations upon areas adjacent to existing Owner-occupied areas and/or structures in such manner as to not interfere with continued free and comfortable use of such areas.
   2. During normal school hours, keep building exits safe, protected, and restricted from remainder of construction site and clear of obstructions at all times. If closure of an exit is required by the Work, notify the school Principal and allow ample time for an alternate exit plan to be executed.
   3. Work shall not be performed in Owner-occupied areas or rooms during normal school hours when such spaces are required for school use. Such Work shall be performed after normal school hours up to 10:00 PM or as agreed upon with Owner, and if no night time school activities are planned. Work may be performed during weekends and vacation periods when school is normally closed if coordinated in advance with school administration. All Work required in rooms or spaces being utilized for school purposes must be closely scheduled with the District such that rooms or spaces may be safely used for school purposes when classes resume.

E. Non-Interference with Serving Utilities:
   1. Do not interrupt electric, gas, water, or other services to existing Owner-occupied structures without prior notice to the District and then only at a definite time and for a definite duration approved by Owner.
      a. Disruption of utilities must be approved by the Owner. Requests must be made 72 hours prior to disruption and a plan detailing a definite start time and duration provided.
   2. Consult with public and private utility companies for location and extent of all utilities before commencing work.
   3. Provide services of a utilities locator to investigate and mark underground utilities in the vicinity of exterior work.
   4. Provide all services required. Protect and maintain existing utilities, active electrical conductors, sewers, pipes, and other active lines either on project site or in offsite street excavations.
   5. Arrange for and pay cost of disconnecting, removing, relocating, capping, replacing, or abandoning of public and private utilities in the way of construction operations in accordance with serving utilities policies, local regulations and governing codes. Utilities, pipes, sewers, electrical conductors and the like to be abandoned shall be capped in accordance with instructions of governing authority or as directed.

F. Protections - Exterior Components:
   1. Protect sidewalks, asphalt paving, concrete, plantings, and lawn areas at all times from spillage of materials used in carrying out the Work. Exercise care to preclude materials from clogging catch basins and yard drains. Leave all drainage items clean and in proper working condition.
   2. Clean, repair, resurface, or restore existing surfaces to their original condition, or completely replace such surfaces to match existing where damaged by construction operations.
   3. Whenever it is necessary to cut and remove fences and/or power lines (whether on private or public property), restore such demolished work to condition at minimum equal to that which existed prior to such demolition.
   4. Damage to property adjacent to Owner's property shall be restored to the satisfaction of respective property owners.

G. Protections - Interior Components:
   1. Contractor is responsible for protection of completed portions of the Work. Provide protection as required such that items are not soiled or damaged during the progression of the Work. Maintain all such protections for the entire duration of the construction until acceptance by Owner.

a. Provide a weathertight condition throughout the Work. Clean, repair, resurface or restore building and site components required to be protected to their original condition, or completely replace items to match existing undamaged portions of Work, where damaged by construction operations.

2. Whenever it is required and/or necessary to demolish portions of work, take all precautions to protect adjacent portions of the work which remain from damage.
3. Keep public areas such as hallways, stairs, elevator lobbies and toilet rooms free from accumulation of waste material, rubbish or construction debris.
4. Gather and shroud all existing furnishings to the extent needed to provide protection from construction dust.
5. Clean, repair, resurface, or restore such items above required to be protected to their original condition, or completely replace items to match existing undamaged portions of work, where damaged by construction operations.

H. Protections: Vegetation and Plantings:
1. Protect all existing trees to remain on-site from foliage, trunk, branch, and root damage.
2. Provide barricades and maintain same around all trees, plantings, and other landscaped areas adjacent to work of this Contract to protect such areas from damage of any nature caused by construction operations.
3. Replace any plantings damaged or destroyed with plants of equivalent type, size, quantity, and nature as approved by Architect.

I. Security:
1. Provide security and facilities to protect the Work and Owner's operations from unauthorized entry, vandalism, and theft.
2. Provide temporary barriers, doors, and locks at all openings after building is enclosed.
3. Lock automotive vehicles and other mechanized or motorized construction equipment when parked and unattended. Do not leave vehicles or equipment unattended with the motor running or ignition key in place.
4. Coordinate with Owner's building security provider and program.

J. Removal of Equipment and Materials:
1. Clear site and surrounding street areas of all equipment, apparatus, appliances, tools, unused materials, and similar items immediately as they cease to be necessary to carry out the Work.

END OF SECTION

SECTION 01 13 31

CERTIFICATE OF COMPLIANCE

No final payment shall be made until the Contractor provides to the Owner, prior to acceptance of the work, a notarized certification of compliance in following form:

The Contractor does hereby certify that all work has been performed and materials supplied in accordance with the drawings, specifications and Contract Documents for the above Work, and that:

No less than the prevailing rates of wages as ascertained by the governing body of the Contracting agency has been paid to laborers, workmen and mechanics employed on this Work;

There have been no unauthorized substitutes of Subcontractors; nor have any subcontracts been entered into without the names of the Subcontractors having been submitted to the Owner prior to the start of such subcontracted work;

No subcontract was assigned or transferred or performed by any Subcontractor other than the original Subcontractor, without prior notice having been submitted to the Owner together with the names of all Subcontractors;

All claims for material and labor and other service performed in connection with these specifications have been paid;

In WITNESS WHEREOF, the undersigned has signed and sealed this instrument this

_____ day of_____, _____

Firm Name: _____

Signature: _____

Title: _____

Attest _____
(Seal if Bidder is a Corporation)

As determined necessary, evidence of compliance may be required to be submitted with and made a part of this Certificate of Compliance.

END OF SECTION

SECTION 01 13 32

CERTIFICATE OF NO HAZARDOUS MATERIALS

No final payment shall be made until the Contractor shall file with the Owner, prior to acceptance of the work, a notarized certificate of no hazardous materials in the following form:

"To the best of my knowledge no hazardous material, including, but not limited to: asbestos, polychlorinated biphenyls (pcb's) and lead based products, is used in the construction of this project. Material safety data sheets will be provided as requested by the Owner for all materials which may be questioned in the future."

In WITNESS WHEREOF, the undersigned has signed and sealed this instrument this

_____day of_____, _____

Firm name: _____

Signature: _____

Title: _____

Attest: _____

(Seal if Bidder is a Corporation)

As determined necessary, evidence of compliance may be required to be submitted with and made a part of this certificate.

END OF SECTION

SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

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

B. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

A. Document 00 72 00 - General Conditions: Additional requirements for progress payments, final payment, changes in the Work.

B. Section 01 78 00 - Closeout Submittals: Project record documents.

C. Section 01 77 00 - Closeout Procedures: Substantial Completion and Final Payment.

1.03 SCHEDULE OF VALUES

A. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement.

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

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

D. Submit Schedule of Values at times indicated in Section 01 30 00 - Administrative Requirements.

E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization. Provide closeout and punchlist line items.

F. For items on which progress payments will be requested for stored materials, break down the cost into:
   1. The cost of materials (only), delivered and unloaded, with taxes and the like, paid.
   2. Remainder of installed value (labor, temporary facilities/equipment needed, etc).
   3. Failure to provide this breakdown prior to materials being delivered voids Contractor's right to be paid for affected materials until they are installed.

G. For each line item of installed value exceeding $20,000, show breakdown by major products or operations under each item.

H. Round-off figures to nearest dollar amount for the original breakdown only.

I. Make sum of total scheduled costs equal to Contract Sum.

J. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 SUBCONTRACTOR AND SUPPLIER LISTING

A. Subcontractor and Supplier Listing: Follow Project Manual Table of Contents as a format for listing name of Subcontractors, including lower-tier Subcontractors and suppliers.
   1. Identify by section number and title the company, address, telephone number and contact person.
   2. Adjacent to Subcontractor list its lower-tier Subcontractor(s) and/or supplier(s).

1.05 APPLICATIONS FOR PROGRESS PAYMENTS

A. Submit a preliminary copy of the Payment Application to Architect for comment prior to formal submittal.

B. Submit applications for payment in accordance with General Conditions using specified forms.
   1. Contractor is encouraged to review the payment application draft during the progress meeting that occurs during the last week of the month.

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

D. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.

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

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

G. Execute certification by signature of authorized officer.
   1. Notarized Affidavit: After the first request for payment, each subsequent request shall be accompanied by notarized affidavit stating that all subcontractors have been paid less earned retainage as their interests appeared in the last payment received. No application for payment by the Contractor shall be processed unless accompanied by such Contractor's affidavit.
   2. In addition, the Owner may require that any requests for payment shall also be accompanied by a receipt with original signature from the Principal Subcontractors including Mechanical and Electrical, and others as required by the Owner, of the dollar amount they received for the previous month's work (less earned retention), and an affidavit by such Subcontractors stating that all sub-subcontractors, suppliers, wages, fringes, and taxes arising out of such subcontract have been paid in full as their interest appeared in the last payment received.

H. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
   1. For applications for stored materials include:
      a. Project.
      b. Application number and date.
         1) Item number and identification as shown on application and description of specific material or product.
         2) Material stored off-site: Record of quantities and bonding/insurance of storage facility.
         3) Must be within 75 driving miles of the site and open to Architect's and Owner's inspections and inventory during regular business hours.
      c. Verification of stored materials and partial payment for such materials do not constitute acceptance on the part of the District. In the event that materials stored are found to be unsuitable for installation or incorporation into the Work for any reason, Contractor shall bear full responsibility for any and all corrections needed.
      d. District shall not be responsible for any additional costs incurred for storage of materials unless such storage is the result of and a part of an approved Change Order where the District is found to be responsible for such costs.

I. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work. Provide a breakdown by major products or operation for amounts in excess of $20,000.

J. Submit four hard copies of each Application for Payment.

K. Include the following with the application:
   1. Transmittal letter as specified for submittals in Section 01 30 00.
   2. Construction progress schedule, revised and current as specified in Section 01 32 00 - Construction Progress Documentation.
   3. Partial release of liens from major subcontractors and vendors.
   4. Affidavits attesting to off-site stored products.

L. Current Record Documents: Prior to acting on processing each monthly request for payment, Contractor is required to present for review to Architect and consultants, a current set of record documents indicating any revisions.

M. Certified Statements of Intent to Pay Prevailing Wage for each trade shall be on file with the Architect and Owner prior to applying for payment of work of that trade. Where such Certified Statements are not provided, that category of work will not be paid until appropriate documentation is filed.

N. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.06 SPECIAL CONDITIONS OF INITIAL PAYMENT

A. Prior to initial payment, the Contractor must have delivered all required insurance, bonds and contracts; acceptable Schedule of Values, Sub-Contractors/Suppliers List, resumes of key personnel, Contractor Construction Schedule.

1.07 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
   1. Submit Application for Final Payment at time indicated in Section 01 30 00 - Administrative Requirements.

B. All Project Closeout activities must be complete; all liens and claims settled; all project record documents transmitted in final approved form; record survey (if required) transmitted and recorded by the County; removal of temporary services, facilities and all debris/materials/ equipment and all other requirements of the General Conditions. All permit drawings, sign-off sheets and Certificates of Occupancy transmitted.

END OF SECTION

SECTION 01 25 00
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittal procedures, coordination.

B. Section 01 60 00 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.

1.03 DEFINITIONS

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

1.04 SUBMITTALS

A. Substitution Requests: Electronically submit each request for consideration as a PDF. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Name of PDF shall reflect the specification Section number and the proposed product manufacturer or product name.
   2. Limit each request to one proposed substitution.
   3. Submit a separate form for each item upon which approval is requested, with the exception of groups of items (e.g., electrical fixtures, plumbing fixtures, etc.) for which an itemized listing may be attached.
   4. Acceptance of the particular product or method on a previous project does not confer or imply acceptance for this project.
   5. Submit samples to Architect upon request.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
   4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
   5. Waives claims for additional costs or time extension that may subsequently become apparent.
   6. Agrees to reimburse Owner and Architect for review or redesign services, detailing, construction costs, or re-approval by authorities caused by the requested substitution.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
   1. Note explicitly any non-compliant characteristics.

C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
   1. Substitution Request Form:
      a. Use Substitution Request Form bound at the end of this Section for substitution requests during the bid phase.

b. Use "Substitution Request (After the Bidding Phase)" form bound at the end of this Section for substitution requests after the Award of Contract.

D. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
1. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
2. 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.
3. Detailed comparison of significant qualities of proposed substitution 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.
4. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
5. Samples, where applicable or requested.
6. Certificates and qualification data, where applicable or requested.
7. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
8. List of availability of maintenance services and replacement materials.
9. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
10. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
11. 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 date of receipt of purchase order, lack of availability, or delays in delivery.
12. Cost information, including a proposal of change, if any, in the Contract Sum.
13. 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.
14. 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.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

A. Submit all requests for substitutions electronically as PDFs.

B. Accepted Substitutions prior to Bid Date will be listed in Addenda published in accordance with Contractor's RFQ. Bidders will not rely upon approvals made in any other manner.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

A. Substitutions will normally not be considered after date listed in the Contractor's RFQ, except when required due to unforeseen circumstances. Within a period of 30 days after date of Contract, the Owner may, at its option, consider formal written requests for substitution of products in place of those specified when submitted in accord with the requirements stipulated herein. To receive consideration, one or more of the following conditions must be documented in any such request:
1. The substitution is required for compliance with final interpretation of Code requirements or insurance regulations.
2. The substitution is required due to unavailability of a specified product, through no fault of the Contractor.
3. The substitution is required because subsequent information disclosed the inability of the specified product to perform properly or to fit in the designated space.

4. Manufacturer's or fabricator's refusal to certify or warrant performance of specified product as required.
5. Subsequent information that a long delivery date will not be compatible with the Contract construction period.
6. 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. Owner reserves the right to reject any and all substitution requests for any reason, without obligation or liability

C. Substitutions will not be considered under one or more of the following circumstances:
1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
2. Submittal for substitution request has not been reviewed and recommended by Contractor. Substitution requests received directly from Subcontractors or Suppliers will be returned through the Contractor without review.
3. Without a separate written request.
4. When acceptance will require revisions to the Contract Documents.
5. Submittal for substitution request does not include point-by-point comparison of proposed substitution with specified product.

3.04 RESOLUTION

A. Architect's Action for Substitutions After Award of Contract: If necessary, Architect will request additional information or documentation for evaluation within 7 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 7 days of receipt of additional information or documentation, whichever is later.
1. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
2. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

END OF SECTION

SUBSTITUTION REQUEST FORM

TO: BRIC Architecture
1233 NW Northrup
Portland, OR 97209
Attn: Nancy.rad@bric-arch.com

PROJECT: Seaside New Middle School/High School

We hereby submit for your consideration the Product described below as a substitute for the specified product indicated:

1. Specified Product:

   Name: _____

   Section:_____ Paragraph: _____

2. Proposed Substitution:

   a. Brand Name:_____

   b. Model/Catalog No.: _____

   c. Manufacturer: _____
   (Name)

   _____
   (Address) (Zip) (Telephone)

   d. Nearest Distributor:_____
   (Name)

   _____
   (Address) (Zip) (Telephone)

   e. Substitute product effects adjacent Work in the following way:

   _____
   _____

3. Supporting Data:

   a. Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

   b. Attached data also includes description of changes to Contract Documents which proposed substitution will require for its proper installation.

4. Certification:

The undersigned certifies that the following paragraphs, unless modified on attachments, are correct:

a. The proposed substitution does not affect dimensions shown on Drawings.

b. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.

c. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.

d. Maintenance and service parts will be locally available for the proposed substitution.

e. The function, appearance and quality of the proposed substitution are equal or superior in all respects to the product specified.

5. Submitted By:

Firm:_____
(Name)

_____
(Address) (Zip) (Telephone)

By:_____ Title: _____
(Please type or print)

Signature:_____

6. Acceptance/Rejection:

Acceptable substitution items will be covered by an Addendum issued to all Bidders.

7. Architects Action:
The following is for use by the Architect:

___ Accepted ___ Accepted with exceptions as noted
___ Not Accepted ___ Received after deadline

Remarks: _____
_____
_____
_____

By:_____ Date: _____

For: BRIC Architecture

END OF FORM

SUBSTITUTION REQUEST
(After the Bidding Phase)

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

_____ Architect Project Number: _____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No: _____

Installer: _____ Address: _____ Phone: _____

History: ☐ New Product ☐ 2-5 years old ☐ 5-10 years old ☐ More than 10 years old

Differences between proposed substitution and specified product: _____

_____

_____

Point by Point comparative data attached - REQUIRED

Reason for not providing specified item: _____

_____

Similar Installation:

Project: _____ Architect: _____

Address: _____ Owner: _____

Date Installed: _____

Proposed substitution affects other parts of Work: ☐ No ☐ Yes, explain _____

_____

Savings to Owner for accepting substitution: _____ ($_____).

Proposed substitution changes Contract Time: ☐ No ☐ Yes [Add] [Deduct] _____ days

Supporting Data Attached:

☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

Attachments: _____

_____

_____

REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01 30 00.

☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 30 00.

☐ Substitution rejected - Use specified materials.

☐ Substitution Request received too late - Use specified materials.

Signed by: _____ Date: _____

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ A/E ☐ _____

_____

_____

_____

_____

_____

_____

_____

SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for processing contract modifications and Change Orders.

1.02 RELATED REQUIREMENTS

A. AIA Document A201 - General Conditions of the Contract for Construction: Governing requirements for changes in the Work, in Contract Cost, and Contract Time.

B. Section 01 20 00 - Price and Payment Procedures: Applications for payment and Schedule of Values.

C. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance (O&M) data, warranties and bonds.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Submit name of individual authorized to accept changes, and to be responsible for informing others in Contractor's employ of changes in the Work.

1.04 GENERAL REQUIREMENTS

A. No additional work shall be undertaken without Owner's and Architect's written approval.

B. Written approval authorizing Contractor to undertake additional Work does not authorize automatic extension of Contract Completion time.

C. Coordinate related requirements specified in other parts of the Project Manual including, but not limited to, General Conditions, Changes in the Work, as supplemented.

1.05 DEFINITIONS

A. Change Order (CO): This document signed by Owner, Contractor and Architect formally changes the Contract Sum or Contract Time and may incorporate Proposal Requests and/or Construction Change Directives.

B. Proposal Request (PR): This document initiated by the Architect is to be priced by the Contractor. Upon authorization by the Owner it becomes a directive to the Contractor to modify the scope of the Contract for inclusion in a future Change Order.

C. Architect's Supplemental Instructions (ASI): This form is a written order comprising instructions or interpretations, signed by Architect making minor changes in the Work not involving a change in Contract Sum or Contract Time. If the Contractor considers that the ASI constitutes a Change in the Work, it must notify the Owner in accordance with the Contract Documents.

D. Construction Change Directive (CCD): A written order to the Contractor, signed by the Owner and Architect, amending Contract Documents as described. This order directs Contractor to proceed with Work that may alter Contract Sum and/or Contract Time, and is intended to be included in a subsequent Change Order pending agreement on changes in the Contract Sum and/or Contract Time.

1.06 SIGNATURES

A. All signatures on Change Orders and Construction Change Directives shall be original; no photocopies, unless electronic signatures are acceptable to all parties. Facsimile signatures shall be followed immediately by mail and/or delivery of originals.

1.07 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.
   1. Form for Minor Changes in the Work: Architect's "Architect's Supplemental Instructions" form.

2. If Contractor determines that an Architect's Supplemental Instruction involves adjustments to the Contract Sum or Contract Time, Contractor shall prepare and issue a Proposal Request to the Architect for approval prior to proceeding with the Architect's Supplemental Instruction.

1.08 DOCUMENTATION OF CHANGE IN CONTRACT SUM AND CONTRACT TIME

A. Maintain detailed records of work performed on a time and materials basis. Provide complete information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

B. Document each quotation for a change in cost or time with sufficient data to allow evaluation of the quotation.

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

D. Contractor and Subcontractors shall provide the following to support their change proposals:
   1. Breakdown of Labor and Equipment rates for use on entire project, with first proposal request to CM/GC.
   2. Production rates shall not exceed that of Means Construction Data, effective June 2018.
   3. Detailed quantities of materials, labor, and equipment.
   4. Markups shall not exceed 10 percent on materials, 15 percent on labor, 5 percent on 3rd party rental, 5 percent on 2nd and 3rd tier Subcontractors.
   5. Justification for any change in Contract Time.
   6. Credit for deletions from Contract, similarly documented.

E. Support each claim for additional costs, and for work performed on a time and materials basis with the following information:
   1. Origin and date of claim.
   2. Dates and times work was performed, and by whom.
   3. Time records and wage rates paid.
   4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

1.09 PROPOSED CHANGE PROCEDURES

A. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 14 days.
   1. Form for Proposal Requests: Architect's "Proposal Request" form.
   2. Form for Fixed Price Quotation: Electronically submitted PDF.

B. If latent or unforeseen conditions require modifications to the Contract, or if an RFI response or an Architect's Supplemental Instruction is determined to have cost or schedule impacts, Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 25 00 - Substitution Procedures.
   1. Form for Proposal Requests: Architect's "Proposal Request" form.
   2. Form for Fixed Price Quotation: Electronically submitted PDF.

C. Proposal Request Log: Maintain a current log of all Proposal Requests and submit same at each project meeting and with each Application for Payment. Each Proposal Request shall have a unique number for tracking purposes.
   1. The log shall, at a minimum, show the Proposal Request number, date initiated, brief description, reference (e.g., RFI or supplemental instruction) estimated cost, estimated time, status and reason for the Proposal Request.

1.10 APPROVAL OR REJECTION OF PROPOSAL

A. When a proposed change is initiated through a Proposal Request:
   1. Submit the following in writing within seven (7) days of date on Proposal Request:
      a. All direct and indirect costs.
      b. Schedule of Values and Unit Prices including basis for costs.
      c. Impact on other Work not described. Describe and include all direct and indirect costs of changes to other Work not specified in the PR.
      d. Quotation will be guaranteed for period specified in the PR beginning from signing of proposal, but, as a minimum, 30 days. If no period is specified, quotation shall be guaranteed for sixty (60) days from signing.
      e. Proposal shall be signed by authorized person.
      f. Failure of the Contractor to respond with pricing in a timely manner shall not be justification for claims by the Contractor of delay of the project associated with the Change.
   2. Architect and Owner will review proposal and respond in writing by one of the following:
      a. Authorizing.
      b. Requesting additional information.
      c. Rejecting.
   3. Authorization to proceed with Change through a recommendation by the Architect to the Owner and written authorization by the Owner directs Contractor to undertake Work.

B. When Change is initiated by Contractor:
   1. Architect and Owner review and respond in writing by one of the following:
      a. Processing a Change Order or Proposal.
      b. Requesting additional information.
      c. Rejecting.
   2. If Owner responds by processing a Proposal Request, follow procedure outlined above.
   3. If additional information is requested by Owner, respond in writing within seven days of Owner's request.

1.11 DOCUMENTATION OF PROPOSALS AND CLAIMS

A. Support each lump sum proposal quotation and each unit price (not previously established) with detailed substantiating data. Clearly cross reference tracking numbers of CCDs, RFIs, PRs, etc. to allow easy identification of costs origins
   1. Include as separate line items any changes related to credits to Contract Sum or Contract Time associated with not performing the originally specified Work.

B. On request, provide additional data to support time and cost computations:
   1. Labor hours, number of workers, time cards and hourly rate cost justification
   2. Equipment hours, make and model, number of pieces required, rental agreements and hourly rate justification.
   3. Products required.
      a. Recommended source of purchase and unit cost.
      b. Quantities required.
   4. Documented credit for Work deleted from Contract.
   5. Justification citing specifics of critical path impacts per current CPM for any change in Contract Time.

C. Support each claim for additional costs, and time-and-material/force account work with documentation, as required for lump-sum proposal. Include additional information:
   1. Name of Owner's authorized agent who ordered work, and date of order.
   2. Dates and times work was performed and by whom.
   3. Time record, summary of hours worked and wage rates paid.
   4. Receipts and invoices for:
      a. Equipment used, listing dates and times of use.
      b. Products used, listing of quantities.

c. Subcontracts.

1.12 CONSTRUCTION CHANGE DIRECTIVES

A. For changes that involve an adjustment to the Contract Sum or Contract Time, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change.
   3. Form for Construction Change Directives: Architect's "Construction Change Directive" form.

1.13 FIXED PRICE CHANGE ORDER

A. Base upon Architect's Proposal Request and Contractor's fixed price quotation; or Contractor's request for Change Order as approved by Architect and Owner.

B. Change Order describes Work changes, additions and deletions, with attachments of authorized Proposal Requests, agreed Construction Change Directives and/or previously agreed upon change pricing or Contract Time modifications.

C. Change Order provides accounting of any Contract Sum and Contract Time adjustment.

1.14 UNIT PRICE CHANGE ORDER

A. For pre-determined unit prices and quantities, Change Order will be executed on a fixed price basis.

B. For unit costs or quantities of units of work which are not predetermined, execute Work under a Construction Change Directive. Changes in Contract Sum or Contract Time will be computed as specified for a time and material Change Order.

1.15 TIME AND MATERIAL CHANGE ORDER

A. Submit itemized account and supporting data after completion of change, within time limits specified in General Conditions of the Contract.

B. Architect will determine the change allowable in Contract Sum and Contract Time as provided in the General Conditions of the Contract.

C. Maintain and provide detailed records of work done on a time and materials basis.

1.16 EXECUTION OF CHANGE ORDERS

A. Architect will issue Change Orders for signatures of parties as provided in General Conditions of the Contract.
   1. Form for Change Orders: Architect's "Change Order" form.

B. Proper signatures (original and dated) on CCD or Change Order authorize Contractor to proceed with Change.

C. Promptly sign and date Change Order or provide detailed written and signed statement detailing reasons if refusing to sign. If the Contractor does not sign and return the Change Order, all aspects will be considered disputed, and Contractor shall not be paid on any Work on it.

1.17 DISTRIBUTION

A. Architect will distribute one electronic copy to Owner and Contractor for review.

B. Change Orders: Upon authorization, all parties will sign originals with original signatures, unless electronic signatures are acceptable to all parties.
   1. Project procedures for distribution will be discussed and agreed upon at the preconstruction meeting.
   2. All parties will receive signed copies of the Change Order for record.

C. Construction Change Directives: Upon authorization, Architect will issue one electronic copy to Owner and Contractor.
   1. Directive describes Work Change additions or deletions, with attachments of revised Contract Documents.
   2. Owner will sign and date as directive to proceed with Change and issue 3 copies to the Contractor.
   3. Promptly sign, date and return two copies to the Architect. If Contractor does not agree with terms, it will proceed with changed Work and follow procedures noted in the General Conditions while still returning one copy to the Architect.
   4. Distribution:
      a. Architect will issue one original to Owner while maintaining one for Architect's files.

1.18 CREDIT AMOUNT TO CONTRACT SUM - INSURANCE

A. If a Change Order or Construction Change Directive results in a reduction of the Contract Sum, the Owner shall be entitled to a credit that includes the amount of the value of bond premium, amounts charged for additives for insurance premium.

1.19 CORRELATION OF CONTRACTOR SUBMITTALS

A. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item. Adjust Contract Sum as shown on Change Order.

B. Promptly revise Progress Schedule to reflect any changes in Contract Time, revise subschedules to adjust times for other items of work affected by the change, and resubmit.

C. Promptly enter changes in Project Record Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Coordination.

B. Electronic document submittals.

C. Preconstruction meeting.

D. Progress meetings.

E. Preinstallation conferences.

F. Project closeout conference.

G. Requests for information (RFI).

H. Coordination drawings.

I. Submittals for review, information, and project closeout.

J. Submittal procedures.

K. Product submittals - detailed requirements.

L. Timing of submittals.

1.02 RELATED REQUIREMENTS

A. Section 01 32 00 - Construction Progress Documentation: Form, content and administration of schedules.

B. Section 01 40 00 - Quality Requirements: Mock-up requirements, Testing Laboratory Reports and Manufacturer's Field Services.

C. Section 01 60 00 - Product Requirements: General product requirements.

D. Section 01 70 00 - Execution: Additional coordination requirements.

E. Section 01 78 00 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 PROJECT COORDINATION

A. Coordinate Work of all personnel, requirements and Work specified throughout the Contract Documents, including Work performed by subcontractors and suppliers.

B. Coordinate scheduling, submittals, and the work of the various Sections of the Specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

C. Contractor's work and responsibilities include, but are not limited to, the following:
   1. Provide all labor, materials, equipment, delivery, tools, machines, facilities, and services necessary for the proper execution of the Work.
   2. Coordinate scheduling, submittals and Work of the various Sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
   3. Ensure that notification to and inspections by permitting agencies are completed in a timely fashion.
   4. Coordinate utility outages with a minimum of 48 hours advance notice to Owner.
   5. Store, protect, and secure materials, on and off site.
   6. Supervise and coordinate after hours work.

D. The separation of portions of the Work into particular divisions of the specifications or sections of the drawings may not in every case conform to the categories of work typically subcontracted to particular crafts or trades. Inform bidders, subcontractors, crafts and trades that work

assigned to them may be contained in sections other than customary. In every case, provide and coordinate at no additional cost to Owner all work required in the Contract Documents.

E. Verify that utility requirement 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, all such equipment.

F. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for piping, ductwork, and conduit as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

G. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish construction and components.

H. Coordinate completion and cleanup of Work of separate Sections in preparation for Substantial Completion and for portions of Work designated for Owner occupancy.

I. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner activities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTALS

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format and transmitted via email directed to the personnel identified at the Preconstruction Meeting.
   1. Besides submittals for review, information, and closeout, this procedure applies to submittal schedule, requests for information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, proposal requests, change orders, construction change directives), applications for payment, field reports and meeting minutes, substitution requests and any other document any participant wishes to make part of the project record.
   2. It is Contractor's responsibility to submit documents in PDF format.
      a. Limit PDF size to 10MB, unless otherwise authorized by Architect.
      b. Name PDF's for product submittals as indicated under "Product Submittals - Detailed Requirements" Article.
   3. Paper document transmittals will not be reviewed, unless otherwise authorized by Architect.
   4. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

3.02 PRECONSTRUCTION MEETING

A. The Owner will schedule a preconstruction conference before the start of construction, at a time convenient to the Owner, Contractor and the Architect, but no later than 10 days after execution of the Agreement. The conference will be held at the Project Site or another convenient location. The meeting shall be conducted to review general issues of responsibilities, communications, and contract administration procedures.

B. Attendance Required:
   1. Owner.
   2. Architect.
   3. Contractor.
   4. Contractor's Superintendent.
   5. Major Subcontractors.
   6. Major Suppliers when requested; others as appropriate.

C. Agenda:
   1. Status of the Contract, bonds, insurance or other contract requirements.
   2. Status/timing of Notice to Proceed.
   3. Distribution of Contract Documents.
   4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
   5. Designation of personnel representing the parties to Contract and Architect.
   6. Contract administration responsibilities, communications and procedures.
   7. Tentative Contractor's construction schedule.
   8. Procedures and processing of field decisions, submittals, substitutions, applications for payments, BOLI requirements, proposal request, Change Orders, and Contract closeout procedures.
   9. Scheduling.
   10. Related work by Owner and coordination with Contractor.
   11. Use of premises and ongoing facility operations.
   12. Review of existing conditions.
   13. Hazardous materials.
   14. Owner's requirements.
   15. Working hours, site access and parking.
   16. Contractor's site mobilization and storage areas.
   17. Material and equipment deliveries.
   18. Maintaining good neighborhood relations and limiting noise, store water, erosion and dust control.
   19. Construction facilities and controls.
   20. Temporary storage.
   21. Security and housekeeping procedures.
   22. Special inspection, testing and quality control, including procedures for testing.
   23. Procedures for maintaining record documents.
   24. Requirements for start-up of equipment.
   25. Inspection and acceptance of equipment put into service during the construction period.
   26. Status of permits.
   27. Progress meeting schedule date and time.
   28. Review of Contract Documents and outstanding questions related thereto.
   29. Scheduling activities of a Geotechnical Engineer.

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

3.03 PROGRESS MEETINGS

A. Progress meetings will be conducted at the Project Site on a weekly basis, or at intervals otherwise agreed to. The schedule of the meetings shall be established by mutual consent of the Owner, Architect and Contractor. No changes to said schedule shall be made without mutual consent of the same parties. Coordinate preparation of the payment request with dates of meetings.
   1. Notify subcontractors and other representatives of scheduled meetings where their attendance is requested.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
   1. Attach a copy of the updated 3-week look ahead schedule.
   2. Distribute a copy of the agenda within 2 days of meeting.

C. Attendees: In addition to representatives of the Contractor, Owner and the Architect, other individuals concerned with current progress or coordination may be represented at these meetings. Participation by Subcontractors shall be limited to attendance only when required by the Architect or when a prearranged topic relating to the specific trade or supplier requires their attendance at the meeting.
   1. Persons designated by the Contractor to attend and participate shall have all required authority to commit the Contractor to solutions as agreed upon in the meeting.

D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of RFIs, ASIs, Proposal Requests, CCDs and Change Orders.
   7. Review of off-site fabrication and delivery schedules.
   8. Site access, utilization and parking.
   9. Problems from or affecting occupants or neighbors.
   10. Permitting and agency issues.
   11. Quality/inspection issues.
   12. Maintenance of progress schedule.
      a. Review progress since the last meeting.
      b. Distribute Contactor's two-week look ahead schedule.
      c. Evaluate current activity is in relation to the Contractor's Schedule.
      d. Identify in advance potential delays involving: submittals, material / equipment procurement; approvals; Owner-furnished materials; or separate contracts, if any.
      e. Determine how construction behind schedule will be expedited; securing commitments from parties involved to do so.
      f. Determine whether a recovery schedule is required for the Contractor's Construction Schedule to insure completion within the contract time.
   13. Coordination of projected progress.
   14. Maintenance of quality and work standards.
   15. Effect of proposed changes on progress schedule and coordination.
   16. Pay Application review at monthly interval.
   17. Review of Project Record Documents.
   18. Other business relating to work.

E. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.
   1. Minutes shall number topics in a manner that reflects when each topic was first raised.
   2. Each topic shall reflect who is responsible for acting on the topic and date by which resolution is required.
   3. No topic shall be dropped from the minutes until the method of resolution is recorded.

3.04 PREINSTALLATION CONFERENCES

A. When required in individual Specification Sections, convene a preinstallation conference at work site prior to commencing work of the Section.
   1. Additional conferences may be conducted as required for performance of the Work.

B. Attendees: The Installer and representatives of manufacturers and fabricators, sub-contractors, Contractor, Owner's representative and Owner's special inspector involved in or affected by the installation, and its coordination or integration with other materials and installations, shall attend the meeting. Advise the Architect of scheduled meeting dates.

C. Notify Architect and Owner minimum four days in advance of meeting date.

D. Agenda: Review the progress of related construction activities, including drawing and specification requirements for the following:
   1. Shop Drawings, Product Data, and quality-control samples and other required submittals.
   2. Time schedules,
   3. Weather limitations.
   4. Manufacturer's recommendations.
   5. Warranty requirements.
   6. Acceptability of substrates.
   7. Quality, inspection, and testing requirements.

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

F. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

G. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.

H. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

3.05 PROJECT CLOSEOUT CONFERENCE

A. Request a meeting to discuss the requirements for project closeout.

B. Attendees: In addition to representatives of the Contractor, Owner and the Architect, other individuals concerned with project closeout may be represented at these meetings.

C. Agenda:
   1. Preparation of record documents.
   2. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
   3. Submittal of written warranties.
   4. Requirements for preparing operations and maintenance data.
   5. Requirements for demonstration and training.
   6. Preparation of Contractor's punch list.
   7. Completion time for correcting deficiencies.
   8. Inspections by authorities having jurisdiction.
   9. Certificate of occupancy and transfer of insurance responsibilities.
   10. Partial release of retainage.
   11. Preparation for final field observation.
   12. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
   13. Submittal procedures.
      a. Project Record Documents.
      b. Operating and maintenance documents.
      c. Warranties and bonds.
      d. Affidavits.
      e. Turnover of extra materials and spare parts.
   14. Owner's partial occupancy requirements.
   15. Installation of Owner's furniture, fixtures, and equipment.
   16. Responsibility for removing temporary facilities and controls.
   17. Final cleaning.
   18. Contractor's demobilization of site.
   19. Maintenance.

D. Architect will record meeting minutes.

3.06 REQUESTS FOR INFORMATION (RFIS)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, prepare and submit an RFI in the form specified.
   1. RFIs shall originate with Contractor. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
   2. Limit topics on each RFI to a single topic to expedite response.
   3. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
   4. If Contractor disagrees with Architect's response to Contractor's RFI, Contractor shall notify Architect within seven days of receipt of response. Lack of such notification shall be understood to mean that Contractor agrees with response.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
   1. Project name.
   2. Date.
   3. Name of Contractor.
   4. RFI number, numbered sequentially.
   5. RFI subject.
   6. Specification Section number and title and related paragraphs, as appropriate.
   7. Drawing number and detail references, as appropriate.
   8. Field dimensions and conditions, as appropriate.
   9. Contractor's suggested resolution. If proposed solution impacts the Contract Time or the Contract Sum, state impact in the RFI.
   10. The following statement:
      a. "This reply is not an authorization to proceed with work involving additional cost, time or both. If any reply requires a change to the Contract Documents, a Change Order or Construction Change Directive must be executed in accordance with the Contract Documents prior to implementation of the reply. Proceeding with the Work in accordance with this RFI response indicates Contractor's acknowledgement that there will be no change in the Contract Sum or Contract Time."
   11. Contractor's signature.
   12. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings and other information necessary to fully describe items needing interpretation.

C. RFI Forms: Contractor's software-generated form with the content specified and as acceptable to the Architect.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
   1. The following RFIs will be returned without action:
      a. Requests for approval of substitutions.
      b. Requests for adjustments in the Contract Time or the Contract Sum.
      c. Requests for interpretation of Architect's actions on submittals.
      d. 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 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 Proposal Request according to Section 01 26 00 - Contract Modification Procedures.
      a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
      b. A response to an RFI is not direction or approval of a change to either Contract Time or Contract Sum.

c. Proceeding with the Work in accordance with an RFI response, without such written notification and an approved Change Order or Construction Change Directive, indicates Contractor's acknowledgement that there is no change to the Contract Time or the Contract Sum.

E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log at each Progress Meeting. Include the following:
1. Project name.
2. RFI number including RFIs that were dropped and not submitted.
3. RFI description.
4. Date the RFI was submitted.
5. Date Architect's response was received.
6. Identification of related Minor Change in the Work, Construction Change Directive, Change Order and Proposal Request, as appropriate.

3.07 COORDINATION DRAWINGS

A. General: Prepare coordination drawings in accordance with the requirements in individual Sections where installation is not completely shown 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. 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.
1. Prepare sections, elevations and details as needed to describe relationship of various systems and components.
2. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
3. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, plumbing and electrical systems.
4. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
5. Show location and size of access doors required for access to concealed dampers, valves and other controls.
6. Indicate required installation sequences.
7. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

C. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility. If the Architect determines that the coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, the Architect will so inform the Contractor, who shall make changes as directed and resubmit.

3.08 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
1. Product data.
2. Shop drawings.
3. Samples for selection.
4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.09 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator for Owner.

3.10 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in conformance to requirements of Section 01 78 00 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

3.11 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Submit submittals to Architect as indicated in Electronic Document Submittals Article above.
   2. Submit Schedule of all shop drawings, product data, and samples as specified in each individual Section of the Project Manual. Include submittal and installation dates of each product and assembly. Coordinate with construction schedule and allow ample time, but in no case fewer than 14 days, for Architect's review. Allow time for possible disapproval, correction, and resubmittal.
   3. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
      a. Provide a separate PDF for each submittal element (Product Data, Shop Drawings, etc.) for each specification Section.
         1) Submit all elements for any Section as a single submittal at the same time.
         2) Do not combine submittals for multiple specification Sections, unless previously approved by the Architect.
      b. Number submittals as indicated in Product Submittals - Detailed Requirements Article.
      c. No secure PDFs allowed.
      d. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
   4. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.

5. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
   a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
   b. Architect will not accept or process submittals which do not have Contractor's signed stamp that reflects Contractor's review and approval.
   c. Submission of submittal by Contractor represents that Contractor has fully reviewed and certified acceptance.
6. Schedule submittals to expedite the Project, and coordinate submission of related items.
   a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
   b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.
7. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
   a. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Architect's review of submittals, unless Contractor notates specific deviations and the deviations are specifically approved by the Architect.
8. Provide space for Contractor and Architect review stamps.
9. When revised for resubmission, identify all changes made since previous submission.
10. Submittals not requested will not be recognized or processed.
11. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.

B. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related work.
   2. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

C. Do not fabricate products or begin work which requires submittals prior to return of submittal with Architect acceptance.

D. Contractor is responsible for timely and efficient submittals and the correctness of the documentation submitted. Costs associated with multiple reviews of submittal information beyond one re-submittal (if any) shall be the responsibility of the Contractor.

E. The Contractor is responsible for timely submittals of any required deferred submittals to the governing agencies.

3.12 PRODUCT SUBMITTALS - DETAILED REQUIREMENTS

A. Present in a clear and thorough manner. Title each drawing with Project Name.

B. Identify field-verified dimensions; show relation to adjacent or critical features of Work or products.

C. Number submittals by submittal section number, followed by a two letter designation for the type of submittal and a number which sequentially numbers submittals in order submitted to Architect. For example, the initial submittal of Section 07 92 00 - Joint Sealants Product Data would be designated 079200-PD-1. If the submittal must be resubmitted it shall be identified as 079200-PD-1R1 and subsequent resubmittal shall be sequentially numbered in order as resubmitted.

D. Shop Drawings (SD):
   1. Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproduction of the Contract Documents or standard printed data.
   2. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

3. Fully illustrate requirements in the Contract Documents including, but not limited to:
   a. Identification of products.
   b. Compliance with specified standards.
   c. Notation of coordination requirements.
   d. Notation of dimensions established by field measurement.
   e. Relationship and attachment to adjoining materials or assemblies, relevant field conditions and all necessary dimensions.

E. Product Data (PD):
1. Submit only pages which are pertinent; mark each copy of standard printed data to identify pertinent products, referenced to Specification Section and Article number.
2. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the Work. Delete information not applicable.
3. Product data that has not been marked to indicate the applicable information will be returned without review.
4. Contractor shall assemble Product Data required for maintenance manuals and submit to Architect in accordance with Section 01 78 00 - Closeout Submittals.

F. Samples (SA):
1. Samples for Initial Selection: Submit one full 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. Architect will retain selected sample for confirmation of subsequent submittals.
2. Submit samples to illustrate functional characteristics of products, including parts and attachments.
3. Approved samples which may be used in the Work are indicated in the individual Specification Sections.
4. Label each sample with identification required for transmittal letter.
5. Verification Samples: Submit the number of samples specified in individual Specification Sections. One of which will be retained by the Architect.
   a. Submit three copies if no number is indicated.
   b. Submit additional samples when copies will be required for distribution to other subcontractors or fabricators for matching or preparation of finish samples.
6. Provide field samples of finishes at project site, at location acceptable to Architect, as required by individual Specifications Section. Install each sample complete and finished. Acceptable finishes in place may be retained in completed work if approved by Architect.

G. Manufacturer's Instructions (MI):
1. Provide at Minimum: Manufacturer's instructions for storage, preparation, assembly, installation, start-up, adjusting, balancing, and finishing in accordance with Section 01 40 00 - Quality Requirements.

H. Manufacturer's Certificates (MC):
1. When specified in individual Specification Sections, submit manufacturers' certificate to Architect/Engineer for review, in quantities specified herein.
2. Indicate material or product in conformance with or exceeding specified requirements. Submit supporting reference date, affidavits, and certifications as appropriate.
3. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect.

3.13 TIMING OF SUBMITTALS

A. General:
1. The listing of submittals hereinafter is set forth as a checklist for Contractor's convenience and is general in nature.
2. Architect reserves the right to add to this list in case of omission of any submittals specified in other Sections but not listed hereinafter.

B. Submittals - Required Within Seven Days Postbid:
   1. Contractor's Qualification Statement.
   2. Letter from Insurance Company - insurance required effective upon Contract.
   3. Letter from Surety - bonds required effective upon Contract.
   4. Breakdown of bid (if requested).
   5. Names of proposed suppliers for each of the principal portions of the Work.
   6. Contractor's Construction Management Personnel: Project Manager - minimum 3 years experience; Field Superintendent - minimum 5 years experience.
   7. Responsibility of Subcontractors.
   8. A designation of the Work to be performed by the Contractor by his own forces.

C. Submittals - Required Within Seven Days After Notice of Intent to Award Contract (Prior to Execution of Contract):
   1. Final List of Subcontractors and major material suppliers for principal portions of the Work.
   2. Evidence of bondability (Performance Bond and Payment Bond).
   3. Certificates of Insurance (on AIA Document G705 or equivalent).
   4. Actual costs (%) of the Contractor's liability insurance.
   5. Endorsements for additional insured.
   6. Statements of State Worker's Compensation coverage.
   7. Copy of Builder's Risk Policy.
   8. Project Organizational Chart.
   9. Key Staff Resumes with telephone and contact information.
   10. Summary of Warranties included in Bid, including duration and start time of each. Itemize any deviations from Bid Document requirements.
   11. Other documents required by Contract Documents.

D. Submittals - Prior to Notice to Proceed:
   1. Executed Agreement.
   2. Certified copies of Contractor's Liability Insurance Policies (AIA Document G705).

E. Submittals - Within Seven Days Following Contract Execution and Prior to Commencing Work:
   1. Deliver Bonds to Owner with copy to Architect.
   2. Performance and Labor & Material Payment Bonds per Oregon Law with certified copy of Power of Attorney from Attorney-in-Fact executing bonds.
   3. Certified Schedule of Prevailing Wage Rates (attach to executed contract).

F. Submittals - Within Thirty Days Following Notice to Proceed and Prior to First Payment Application:
   1. Schedule of values - submit at least 14-days in advance of application.
   2. Schedule of submittals.
   3. Copies of acquired and unacquired building permit licenses etc. to complete the Work of the Contract. Submit copies of any remaining permits as they are acquired.
   4. Construction schedule.

G. Submittals - Prior to Each Month's Progress Payment:
   1. Submit 10 days in advance of date established for progress payment.
   2. Application and Certificate for Payment (AIA Document G702 and G703).
   3. Notarized affidavit of payments to all subcontractors and major material suppliers (see application for payment).
   4. Updated Construction Schedule.
   5. Public Works Contractor Wage Certification per Oregon Law.

H. Submittals - Prior to request for Substantial Completion:
   1. Notification to Architect that Work of the Project is substantially complete.
   2. Itemized listing of items of work to be completed or corrected.
   3. Submit Certificate of Occupancy or Occupancy Permit issued by the Local Building Department for the entire Project.
   4. Draft Operations and Maintenance Manuals and draft warranties.

I. Submittals - Prior to request for Final Completion:
   1. Certified copy of punchlist items completed.
   2. Submit final Application for Payment.
   3. Demonstration and Training training reports.
   4. Final complete and correct Operations and Maintenance Manuals.
   5. Record Drawings of Contract Documents with all changes indicated.
   6. Final dated and signed Warranties.

END OF SECTION

SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, with network analysis diagrams and reports.

C. Material location reports.

D. Field condition reports.

E. Special reports.

1.02 REFERENCES

A. AGC (CPSM) - Construction Planning and Scheduling Manual; Associated General Contractors of America.

1.03 SUBMITTALS

A. Preliminary Schedule: Within 14 days after date of Owner's Notice of Intent to Award the Contract, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.
   1. Submit minimum two hard copies to Architect and Owner for review.
   2. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

B. Construction Schedule: Within 14 days after date established in Notice to Proceed, submit draft of proposed complete schedule for review.
   1. Include written certification that structural, mechanical, electrical and other Subcontractors have reviewed and accepted proposed schedule.
   2. Not less than 10 percent of the initial Application for Payment may be withheld until a complete Construction Progress Schedule has been submitted in a form acceptable to Architect and Owner.
   3. Neither Owner nor Architect shall be responsible for review of the entire substance of the Progress Schedule.
   4. Within 30 days after dated established in Notice to Proceed, submit complete schedule.
   5. Submit updated schedule with each Application for Payment.
   6. At each progress meeting, submit the following:
      a. Updated schedule incorporating revisions to the construction schedule.
      b. A two-week look-ahead schedule listing current and upcoming activities by trade, including anticipated start and complete dates as applicable.
      c. Recovery schedule and solutions if needed.

C. Submit the number of opaque reproductions that Contractor requires, plus two copies that will be retained by Architect.

D. Material Location Reports: Submit at monthly intervals.

E. Field Condition Reports: Submit at time of discovery of differing conditions.

F. Special Reports: Submit at time of unusual event.

1.04 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one year minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

B. Develop and portray in a manner consistent with Architect's and Owner's ability to interpret the information conveyed by the Schedule. Make any and all format or other changes required by Architect and Owner to facilitate their interpretations of the Schedule.

1.05 SCHEDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

B. Diagram Sheet Size: Maximum 30 x 42 inches or width required.

C. Scale and Spacing: To allow for notations and revisions.

PART 2 PRODUCTS

2.01 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a preliminary network diagram.

B. Content
   1. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
   2. Identify each item by specification section number.
   3. Identify work of separate floors and other logically grouped activities.
   4. Include conferences and meetings in schedule.
   5. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
   6. Show product and installation dates for major products.
   7. Provide separate schedule of submittal dates for shop drawings, product data, and samples, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.
   8. Include a line item for Project Closeout with additional detail added as the activity approaches.
   9. Include not less than 15 days for startup and testing.
   10. Coordinate content with schedule of values specified in Section 01 20 00 - Price and Payment Procedures.
   11. Include not more than 30 days for punch list and final completion, unless otherwise indicated.
   12. Provide legend for symbols and abbreviations used.

2.02 NETWORK ANALYSIS

A. Prepare network analysis diagrams and supporting mathematical analyses using the Critical Path Method.

B. Schedule shall include date of Notice to Proceed, date of Substantial Completion, and date of Final Completion in accordance with Contract Documents.
   1. Critical Path shall be clearly indicated on Schedule.
   2. Not more than 20 percent of the progress activities shall be on the Critical Path at any one time.
   3. Not more than 5 percent of the total individual activities may exceed $50,000 or 20 calendar days (per activity) without prior approval.

C. Illustrate order and interdependence of activities and sequence of work; how start of a given activity depends on completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.

D. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:
   1. Preceding and following event numbers.
   2. Activity description.
   3. Estimated duration of activity, in maximum 20 day intervals.
   4. Earliest start date.
   5. Earliest finish date.
   6. Actual start date.
   7. Actual finish date.
   8. Latest start date.

9. Latest finish date.
10. Total and free float; float time shall accrue to Owner and to Owner's benefit.
11. Monetary value of activity, keyed to Schedule of Values.
12. Percentage of activity completed.
13. Responsibility.

E. Analysis Program: Capable of compiling monetary value of completed and partially completed activities, accepting revised completion dates, and recomputation of all dates and float.

F. Milestone completion dates shall be clearly shown on the Schedule.

G. If abbreviations are used on the Schedule, a legend shall be provided to define all abbreviations.

H. Required Reports: List activities in sorts or groups:
1. By preceding work item or event number from lowest to highest.
2. By amount of float, then in order of early start.

I. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.03 TWO-WEEK WORK SCHEDULE

A. Each week, prepare and present an updated schedule showing the planned activities for the next two weeks and one week prior. The schedule shall be coordinated with the master schedule and accurately portray activities completed and activities planned for the upcoming weeks. Present this schedule at the weekly progress meeting.

2.04 SCHEDULE - DRIVEN REQUIREMENTS

A. A schedule for the purchase, delivery, and receipt of critical items required for performance of the Work, showing lead times between purchase order placement and delivery dates, shall be integrated with the Construction Progress Schedule. Neither the Architect nor the Owner shall be deemed to have approved or accepted any such material, or its schedule, nor deemed to have waived this requirement if some or all of the material is not received.

B. Should the Contractor fail to meet any scheduled date as shown on the current Construction Progress Schedule, the Contractor shall, if requested, be required at its own expense to submit within ten days of the request an updated Construction Progress Schedule. If the Contractor's progress indicates to the Owner that the Work will not be Substantially Completed within the Contract Time, the Contractor shall, at its own expense, increase its work force and/or working hours to bring the actual completion dates of the activities into conformance with the Construction Progress Schedule and Substantial Completion within the Contract Time. The Contractor shall reschedule and also submit a revised Construction Progress Schedule at its own expense within ten days of notice from the Architect that the sequence of work varies significantly from that shown on the current Schedule showing work to complete on original Contract Time with approved extensions. Neither the Owner nor the Architect will, however, be obligated to review the substance or sequence of the Construction Progress Schedule or otherwise determine whether it is correct, appropriate or attainable.

C. Schedule Float Utilization:
1. Any float time to activities not on the critical path shall belong to the Project, and may be used by the Project to optimize its construction process. Any float time between the end of the final construction activity and the final completion date shall belong to the Owner, and may be used by the Owner in determining if additional contract days are to be awarded for changes in the contract or for delays to the contract caused by the Owner. The Contractor will not be entitled to any adjustment in the Contract Time, the Construction Schedule, or the Contract Sum, or to any additional payment of any sort by reason of the Owner's use of float time between the end of the final construction activity and the final completion date or by reason of the loss or use of any float time, including time between the Contractor's anticipated completion date and end of the Contract Time, whether or not the float time is described as such on the Construction Progress Schedule.

D. Closeout: In the Contractor's Construction Schedule provide key activities required under Section 01 77 00 - Closeout Procedures, Section 01 78 00 - Closeout Submittals. These activities will be cost-loaded to a cumulative total of not less than 2 percent of the contract value.

2.05 REPORTS

A. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.06 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

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

PART 3 EXECUTION

3.01 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Architect at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review and resubmit within 10 days.

3.02 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Update diagram to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

3.03 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Architect, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

END OF SECTION

SECTION 01 32 33
PHOTOGRAPHIC DOCUMENTATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preconstruction photographs.

B. Periodic construction photographs.

C. Periodic aerial construction photographs.

D. Final completion construction photographs.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittal requirements.

1.03 SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

B. Digital Photographs: Submit image files within three days of taking photographs.

1.04 USAGE RIGHTS

A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

B. Do not display photographs in publications without permission of Owner.

PART 2 PRODUCTS

2.01 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 8 megapixels, and at an image resolution of not less than 1600 by 1200 pixels and 400 dpi.

PART 3 EXECUTION

3.01 CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
   1. Maintain key plan with each set of construction photographs that identifies each photographic location.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
   1. Date and Time: Include date and time in file name for each image.
   2. Key Plan: Include digital copy of key plan with each electronic submittal; include point of view identification in each photo file name.
   3. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect.

C. Preconstruction Photographs: Before commencement of excavation, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.
   1. Flag excavation areas before taking construction photographs.
   2. Take 20 photographs to show existing conditions adjacent to property before starting the Work.
   3. Take 20 photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.

4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
5. Take preconstruction aerial photographs from a minimum of 8 vantage points around the site. Determine best altitude or altitudes to depict site and scope of project.

D. Periodic Construction Photographs: Take 20 photographs monthly, coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

E. Periodic Aerial Construction Photographs: Take periodic aerial photographs from a minimum of 8 vantage points around the site. Determine best altitude or altitudes to depict site and scope of project.
1. Coordinate with Owner and Architect prior to flying site to determine sufficient progress between flights and any special vantage point locations.
2. Include a minimum of six periodic flights approximately every three months of the construction period.

F. Final Completion Construction Photographs: Take 20 color photographs after date of Substantial Completion for submission as project record documents. Architect will inform photographer of desired vantage points.
1. Do not include date stamp.

END OF SECTION

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. References and standards.

C. Testing and inspection agencies and services.

D. Control of installation.

E. Mock-ups.

F. Tolerances.

G. Manufacturers' field services.

H. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Document 00 31 00 - Available Project Information: Soil investigation data.

B. Section 01 30 00 - Administrative Requirements: Submittal procedures.

C. Section 01 42 16 - Definitions.

D. Section 01 60 00 - Product Requirements: Requirements for material and product quality.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
   1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
   2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

C. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

D. Manufacturer's Field Reports: Submit reports in quantities as specified for Product Data.
   1. Submit report within 30 days of observation to Architect for information.

E. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility, in accordance with Section 1709.1 of the Oregon Structural Specialty Code, sent to authorities having jurisdiction and the Owner before starting work on the following systems.
   1. Seismic-force resisting system, designated seismic system, or component listed in the designated seismic systems and seismic-force-resisting systems statement of inspections indicated on the Structural Drawings.
   2. Main wind-force resisting systems and wind-resisting components listed in the wind-force-resisting systems statement of special inspections indicated on the Structural Drawings.

F. 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.

1.04 DEFINITIONS

A. Mock-ups: Full size physical assemblies that are constructed on-site. Mock-ups are constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mock-ups are not Samples. Unless otherwise indicated, approved mock-ups establish the standard by which the Work will be judged.
   1. Partial Mock-ups: Mock-ups of specific items or finishes.

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

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

1.05 CONFLICTING REQUIREMENTS

A. Metal Thickness: Where thickness of metals is designated in both gage and thickness in inches, the thickness in inches shall govern. Gages are provided for convenience only. Specified submittals for metals shall indicate thicknesses in inches.

1.06 REFERENCES AND STANDARDS

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

B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

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

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

1.07 TESTING AND INSPECTION AGENCIES AND SERVICES

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. 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. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
   1. 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.
   2. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
   3. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

4. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

1.08 MANUFACTURER'S FIELD SERVICES

A. Manufacturer's Field Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

A. Mock-ups: Before installing portions of the Work requiring mock-ups, build mock-ups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
   1. Build mock-ups in location and of size indicated or, if not indicated, as directed by Architect.
   2. Notify Architect seven days in advance of dates and times when mock-ups will be constructed.
   3. Employ supervisory personnel who will oversee mock-up construction. Employ workers that will be employed during the construction at the Project.
   4. Demonstrate the proposed range of aesthetic effects and workmanship.
   5. Obtain Architect's acceptance of mock-ups before starting work, fabrication, or construction.
      a. Allow seven days for initial review and each re-review of each mock-up.
   6. Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed Work.
   7. Demolish and remove mock-ups when directed, unless otherwise indicated.

B. Partial Mock-ups: Construct partial mock-ups of selected items or finishes, complete. Provide required lighting and additional lighting where required to enable Architect to evaluate quality of the Work. Provide specified partial mock-ups
   1. Partial mock-ups include, but are not limited to, architectural quality concrete and fluid-applied waterproofing.

3.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

A. See individual specification sections for testing and inspection required.

B. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.
      a. One copy of all testing and inspection reports shall be promptly sent directly to the Contractor, Architect, Owner, Structural Engineer, Building Department, Soils Engineer (Soil Compaction), unless otherwise directed.
      b. In addition to written reports, immediately notify by telephone Architect, Owner and Contractor of any portions of the work found to be in non-compliance with the Contract Documents.

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

D. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. Facilitate geotechnical monitoring.
      e. To provide storage and curing of test samples.
   4. Notify Architect and laboratory 48 hours prior to expected time for operations requiring testing/inspection services.
      a. When tests or inspections cannot be performed, through the fault of the Contractor, reimburse the Owner for the additional costs incurred.
      b. Schedule testing and inspection so that the services of testing and inspection personnel will be as continuous and brief as possible.
      c. Reimburse Owner for travel and lodging expenses incurred for testing and inspection services performed outside radius of 100 miles of the site.
   5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
      a. When tests or inspections cannot be performed, through the fault of the Contractor, reimburse the Owner for the additional costs incurred.

6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
    a. Schedule testing and inspection so that the services of testing and inspection personnel will be as continuous and brief as possible.
    b. Reimburse Owner for travel and lodging expenses incurred for testing and inspection services performed outside radius of 100 miles of the site.

E. Contractor shall be responsible for coordinating testing services so as to ensure that tests are performed and reports delivered in a manner not to cause delays to the Work. Allow adequate time for inspection, geotechnical monitoring and any needed corrections before proceeding to the next construction stage.

F. Furnish records, drawings, certificates, and similar data as may be required by the testing personnel to assure compliance with the Contract Documents.

G. Provide to the testing agency the approved design mix to be used for concrete, mortar, grout, and other materials mixes which require testing by the testing laboratory. Furnish copies of product test reports performed by Contractor as required by Contract Documents.

H. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

I. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.05 INSPECTION AND TESTING LABORATORY REPORTS

A. The testing agency will perform and furnish the following:
    1. Laboratory Test Reports: Furnish laboratory test reports of materials and construction as required, including:
        a. Date issued.
        b. Project title and number.
        c. Testing laboratory or engineering firm name, address, and telephone number.
        d. Name and signature of representative.
        e. Description of method of test.
        f. Identification of sample and portion of the work tested
        g. Description of location in the work of the sample.
        h. Time and date of obtaining sample.
        i. Time and date of test of sample.
        j. Weather and climatic conditions.
        k. Evaluation of results tests, including recommendations for action, when requested by Architect or Structural Engineer.
    2. Field Inspection Reports: Furnish field inspection reports for each site visit documenting activities, observations, and inspections of work being inspected include:
        a. Date issued.
        b. Project title and number.
        c. Testing Laboratory or engineering firm name, address, and telephone number.
        d. Name and signature of representative.
        e. Observations on weather and climatic conditions.
        f. Time and date
        g. Conditions and/or status of the work being inspected.
        h. Actions taken.
        i. Recommendations or evaluation of the work.
    3. Reports will be submitted to Owner and Architect in duplicate giving observations and results of tests, indicating compliance or non-compliance with specified standards and with Contract Documents.

3.06 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of

surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

C. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
   1. Name, address, and telephone number of technical representative making report.
   2. Statement on condition of substrates and their acceptability for installation of product.
   3. Statement that products at Project site comply with requirements.
   4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
   5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
   6. Statement whether conditions, products, and installation will affect warranty.
   7. Other required items indicated in individual Specification Sections.

3.07 DEFECT ASSESSMENT

A. When tests or inspection indicate non-compliance with the Contract Documents, subsequent retesting occasioned by such noncompliance shall be performed by the same personnel as performed the initial tests or inspections, and the additional cost shall be paid by the contractor as stipulated under the Conditions of the Contract.

B. Contractor shall remove and replace any work found defective or not in compliance with the Contract Documents at no additional cost to Owner, and furnish notice for retesting as specified herein above.

C. Replace Work or portions of the Work not conforming to specified requirements.

3.08 REPAIR AND PROTECTION

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

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

END OF SECTION

SECTION 01 40 05
CUTTING AND PATCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements and limitations for cutting and patching of the Work.

1.02 RELATED REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.

B. Section 01 70 00 - Execution: Examination, preparation, and general installation procedures.

1.03 REPAIR AND PROTECTION

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

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

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Submit written request in advance of cutting or alteration which affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather-exposed or moisture-resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight-exposed elements.
   5. Work of Owner or separate contractor.

C. Include in request:
   1. Identification of Project.
   2. Location and description of affected work.
   3. Necessity for cutting or alteration.
   4. Description of proposed work, and products to be used.
   5. Alternatives to cutting and patching.
   6. Effect on work of Owner or separate contractor.
   7. Written permission of affected separate contractor.
   8. Date and time work will be executed.

PART 2 PRODUCTS

2.01 MATERIALS

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

B. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 25 00.

PART 3 EXECUTION

3.01 GENERAL

A. Execute cutting, fitting, patching and finishing including excavation and fill, to complete Work, and to:
   1. Fit the several parts together, to integrate with other work.
   2. Uncover work to install ill-timed work.
   3. Match work that has been cut to adjacent work.
   4. Repair areas adjacent to cuts to required condition.
   5. Repair new work damaged by subsequent work.
   6. Remove and replace defective and non-conforming work.

7. Remove samples of installed work for testing.
8. Provide openings in elements of Work for penetrations of mechanical and electrical work.
9. Provide finished appearance of surfaces and to match adjacent surfaces (unless otherwise noted) affected by the Work.

3.02 INSPECTION

A. Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

B. After uncovering, inspect conditions affecting performance of work.

C. Beginning of cutting or patching means acceptance of existing conditions.

3.03 PREPARATION

A. Provide supports to assure structural integrity of surroundings; devices and methods to protect other portions of Project from damage.

B. 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. Maintain excavations free of water.

C. 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 prevent interruption to occupied areas.

3.04 PERFORMANCE

A. Execute work by methods to avoid damage to other work, and which will provide proper surfaces to receive patching and finishing.

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

C. 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. 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.

D. 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. Provide materials and comply with installation requirements specified in other Sections, where applicable.
   1. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.
   4. Replacement of defective work will not create new seams or joint lines.
   5. Restore work with new products in accordance with requirements of Contract Documents.
   6. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
   7. At penetrations of fire-rated wall, ceiling, or floor construction, completely seal voids with fire-rated material, full thickness of the construction element.

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

3.05 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements. Materials subject to testing and inspection in the specifications shall be retested after cutting and patching operations are completed.

END OF SECTION

SECTION 01 42 16
DEFINITIONS

PART 1 GENERAL

1.01 SUMMARY

A. This section supplements the definitions contained in the General Conditions.

B. Other definitions are included in individual specification sections.

1.02 SPECIFICATION EXPLANATION

A. The specifications are divided into Divisions and Sections for the convenience of writing and using. The titles of these are not intended to imply a particular meaning nor to fully describe the work of each division or section, and are not an integral part of the text which specifies the requirements. The Architect is not bound to define the limits of any subcontract, and will not enter into disputes between the Contractor and its employees, including subcontractors.

B. These specifications are of the abbreviated, or "streamlined" type, and include incomplete sentences. Words and meanings shall be interpreted as appropriate. Words that are implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.

C. Omissions of words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the drawings.

D. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

1.03 DEFINITIONS

A. The definitions in this Section are not necessarily complete or exclusive but, generally, apply to all portions of the Work. Some contractual definitions appear in the General Conditions. Definitions of words of a special nature which relate to Work covered in one or two Sections of the Specifications are included in such Sections. Terms used throughout the Contract Documents are defined in this Section.

B. Approve: Where used in conjunction with the Architect's or Engineer's response to submittals, requests, applications, inquiries, reports, and claims by the Contractor, the meaning of the term "approved" will be held to the limitations of the Architect's responsibilities and duties as specified in the General and Supplementary Conditions. In no case will "approval" by the Architect be interpreted as an assurance to the Contractor that the requirements of the Contract Documents have been fulfilled. The term “or approved” used in conjunction with specified materials means “properly submitted and approved substitution request.”

C. Coordinate: The term "coordinate" means satisfactorily combine the work of all trades for a complete and operating installation.

D. Directed, Requested, etc.: Unless otherwise explained, terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by the Architect", "requested by the Architect", etc. However, no such implied meaning will be interpreted to extend the Architect's responsibility into the Contractor's area of construction supervision.

E. Furnish: To supply, deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations, and inspect for damage.

F. General Requirements: The provisions or requirements of Divisions 01 Sections apply to entire work of Contract and, where so indicated, to the other elements of work which are included in the Project.

G. Guarantee and Warranty: "Warranty" is generally used in conjunction with products manufactured or fabricated away from the project site, and "guarantee" is generally used in conjunction with units of work which require both products and substantial amounts of labor at

the project site. The resulting difference is that warranties are frequently issued by manufacturers and frequently supported (partially) by product guarantees from contractors and/or installers.

H. Indicated: A cross reference to details, notes or schedules on the Drawings, to other paragraphs or schedules in the Specifications, and to similar means of recording requirements in the Contract Documents. Where terms such as “shown”, “noted”, “scheduled”, and “specified” are used in lieu of “indicated”, it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.

I. Install: To unpack, assemble, erect, apply, place, anchor, work to dimension, finish, cure, protect, clean, start up, and make ready for use.

J. Installer: The person or entity engaged by the Contractor or his Subcontractor or Sub-subcontractor for the performance of a particular unit of work at the project site, including installation, erection, application and similar required operations. It is a general requirement that Installers be recognized experts in the work they are engaged to perform.

K. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.

L. Project Manual: The term "Project Manual" are the volumes which include the Bidding Requirements, Conditions of the Contract, and the Specifications, Divisions 01 through 41 inclusive, as applicable, and as listed in the Table of Contents bound therein.

M. Provide: To furnish and install, complete and ready for the intended use.

N. Selected: The term "selected" means "selected by the Architect and Owner"; the Architect shall be the sole judge of the acceptability of a product or an installation.

O. Site: Space available to the Contractor for performing the Work under this Contract, either exclusively or in conjunction with other contractors as part of the overall Project. The Site may be unimproved vacant land, an existing building or space within an existing building. The extent of the Site is shown on the Drawings.

P. Specification Language: Imperative language is used, generally, throughout the Specifications. Requirements expressed imperatively are to be performed by the Contractor. For clarity at certain locations, contrasting subjective language is used to describe responsibilities which must be performed by the Contractor or, when so noted, will be performed by others.

Q. Supply: Same as Furnish.

R. Trades: Using terms such as carpentry is not intended to 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 tradespersons of the corresponding generic name.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 45 05
FIELD ENGINEERING

PART 1 GENERAL

1.01 SECTION INCLUDES

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.

1.02 RELATED REQUIREMENTS

A. Document 00 31 00 - Available Project Information: Geotechnical Report and Site Topographical Survey.

B. Section 01 77 00 - Closeout Procedures: Submitting surveys.

1.03 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.

1.04 SUBMITTALS

A. Qualification Data: For land surveyor.

B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

C. Submit name, address, and telephone number of land surveyor before starting survey work.

D. Certified Surveys: Submit two copies stamped and signed by land surveyor.
   1. Submit documentation verifying accuracy of survey work, including copies of logs and field information.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 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, 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.
   3. Provide notice to the utility locator service at least 2 business days prior to any excavation work. Before commencing any excavation, provide notice of the scheduled commencement of excavation to all owners of underground facilities. Notice shall be communicated to the owners of underground utilities not less than 2 business days or more than 10 business days before the scheduled date of commencement of excavation unless otherwise agreed by all parties involved.
      a. Attention: Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0010 through 952-001-0090. You may obtain copies by calling the center at 503-232-1987. If you have questions about the rules, you may contact the center. You must notify the center at least two business days before commencing any excavation.
   4. Excavation shall not proceed until all known facilities have been marked.

5. If an underground facility is damaged and such damage is the consequence of the failure to fulfill an obligation under the requirements of this Section, the party failing to perform that obligation shall be liable for any and all damages in accordance with Washington State Law.
6. Records: Maintain complete, orderly, legible and accurate logs of control and survey work and utility locations as the work progresses.

3.02 PREPARATION

A. Existing Utility Information: Furnish information to local utility and Owner 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.

3.03 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. If discrepancies are discovered, notify Architect promptly.

B. General: Engage a land surveyor to lay out the Work using 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 dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
6. 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.

3.04 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. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect 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.

C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing critical building and site dimensions, locations, angles, elevations of construction and sitework, as-built locations of all utilities and all civil structures including rim and invert elevations.

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufacturer's standard warranties and special warranties.

B. General product requirements.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Substitution limitations.

F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Section 01 25 00 - Substitution Procedures: Substitutions made during and after the Bidding/Negotiation Phase.

B. Section 01 40 00 - Quality Requirements: Product quality monitoring.

C. Section 01 74 19 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting packaging and substitutions.

1.03 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Submit within 15 days after date of Agreement.
   2. For products specified only by reference standards, list applicable reference standards.

B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

1.04 QUALITY ASSURANCE

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

B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

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.

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

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

F. Contractor warrants to the Owner that the materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of material and equipment.

1.05 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: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
   2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
   1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
   2. Refer to Divisions 02 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 77 00 - Closeout Procedures.

PART 2 PRODUCTS

2.01 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.
   1. Means new material, machinery, components, equipment, fixtures, and systems comprising the Work. Does not include machinery and equipment used for preparation, fabrication, conveying, and erection of the Work.
   2. Products may also include existing materials or components when specifically designated for reuse.

B. DO NOT USE products having any of the following characteristics:
   1. Made using or containing CFC's or HCFC's.
   2. Made of wood from newly cut old growth timber.

2.02 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, 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. Two or more items of the same kind shall be considered identical and by the same manufacturer.
   4. Provide products suitable for service conditions.
   5. Adhere to equipment capacities, sizes and dimensions shown or specified unless variations are specifically approved in writing.

6. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
7. Where products are accompanied by the term "as selected," Architect will make selection.
8. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming Products of More than One Manufacturer: Use one of the products named and meeting specifications, no options or substitutions allowed.

D. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

E. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Submit a request for substitution for other named manufacturers. Use of manufacturers not named not allowed.

F. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
   1. If no product available within specified category matches and complies with other specified requirements, comply with requirements for substitutions

G. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.04 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

A. See Section 01 25 00 - Substitution Procedures.

3.02 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. 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.

E. Transport and handle products in accordance with manufacturer's instructions.

F. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

G. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

H. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

I. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store materials in a manner that will not endanger Project structure.

C. Store and protect products in accordance with manufacturers' instructions.

D. Store with seals and labels intact and legible.

E. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

F. For exterior storage of fabricated products, place on sloped supports above ground.

G. Provide off-site storage and protection when site does not permit on-site storage or protection.

H. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

I. Comply with manufacturer's warranty conditions, if any.

J. Do not store products directly on the ground.

K. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

L. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

M. Prevent contact with material that may cause corrosion, discoloration, or staining.

N. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

O. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 70 00
EXECUTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Protection of installed construction.

C. Correction of the Work

D. Progress cleaning.

1.02 RELATED REQUIREMENTS

A. Section 01 45 05 - Field Engineering: Construction layout.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.04 QUALITY ASSURANCE

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

1.05 PROJECT CONDITIONS

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

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where applicable, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
   1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
      a. Description of the Work.
      b. List of detrimental conditions, including substrates.
      c. List of unacceptable installation tolerances.
      d. Recommended corrections.
   2. Verify compatibility with and suitability of substrates, including compatibility with finishes or primers.
   3. Examine roughing-in for mechanical, plumbing, fire suppression and electrical systems to verify actual locations of connections before equipment and fixture installation.
      a. Verify that utility services are available, of the correct characteristics, and in the correct locations.
   4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
      a. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
   5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

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

3.02 PREPARATION

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

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

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

D. 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.

E. Verify space requirements and dimensions of items shown diagrammatically on Drawings.

F. Review Contract Documents and field conditions. Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect according to requirements in Section 01 30 00 - Administrative Requirements.

3.03 GENERAL INSTALLATION REQUIREMENTS

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
   2. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
   3. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
   4. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
   5. Make neat transitions between different surfaces, maintaining texture and appearance.
   6. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   7. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
   8. Architect may make minor adjustments in fixture, outlet, grille, louver, or ventilator locations prior to rough-in work with no additional cost.

B. Installer Inspections: Require installer of each major unit of work to inspect substrate and conditions for installation and to report unsatisfactory conditions in writing.
   1. Correct unsatisfactory conditions before proceeding with installation.
   2. Inspect each product immediately before installation.
   3. Do not install damaged or defective products, materials or equipment.
   4. Start of installation shall be understood as acceptance of substrate conditions by the installer.

C. Clearances: Provide adequate clearance between Architectural, Structural, Mechanical and Electrical systems. Verify physical dimensions of equipment and its available space. Check access routes through concealed or existing spaces for installation of systems or equipment.
   1. Review the Contract Documents for possible conflicts prior to rough-in. Verify that equipment will fit in the space provided. Resolve conflicts with the Architect prior to rough-in work.

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

E. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

F. 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.

G. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

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

I. Attachment: Provide blocking, attachment plates, 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.
   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.

J. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

K. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.04 PROTECTION OF INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual specification Sections.

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

C. Provide and maintain temporary shoring and lateral bracing of structure during erection to resist all loads including:
   1. Wind
   2. Seismic
   3. Construction
   4. Materials
   5. Moving equipment

D. Do not remove temporary bracing and shoring until adequate, permanent connections or structural elements are in final position and positively anchored.

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

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

G. 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.

H. Prohibit traffic from landscaped areas.

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

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

3.05 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. 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. Restore permanent facilities used during construction to their specified condition.

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

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

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

3.06 PROGRESS CLEANING

A. General: 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.
   3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
      a. Utilize containers intended for holding waste materials of type to be stored.
   4. Daily cleaning shall include magnetic sweep of jobsite to pick up all nails and metallic debris.

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 in Finished Areas: 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. Comply with waste disposal requirements in Section 01 74 19 - Construction Waste Management and Disposal.

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 assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

END OF SECTION

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
   1. Aluminum and plastic beverage containers.
   2. Corrugated cardboard.
   3. Wood pallets.
   4. Clean dimensional wood: May be used as blocking or furring.
   5. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
   6. Glass.
   7. Gypsum drywall and plaster.
   8. Plastic buckets.
   9. Carpet tile, and carpet remnants: DuPont (http://flooring.dupont.com) and Interface (www.interfaceinc.com) conduct reclamation programs.
   10. Paint.
   11. Plastic sheeting.
   12. Rigid foam insulation.

E. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements.

F. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.

G. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. Section 01 50 00 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Submit Waste Management Plan within 10 calendar days after receipt of Notice of Award of Bid, or prior to any trash or waste removal, whichever occurs sooner; submit projection of all trash and waste that will require disposal and alternatives to landfilling.

C. Waste Management Plan: Include the following information:
   1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.
   2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
   3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
   4. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
   5. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
   6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.

PART 2 PRODUCTS

2.01 PRODUCT SUBSTITUTIONS

A. See Section 01 60 00 - Product Requirements for substitution submission procedures.

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 01 50 00 for additional requirements related to trash/waste collection and removal facilities and services.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings, particularly at:
   1. Pre-bid meeting.
   2. Pre-construction meeting.
   3. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
   1. Provide containers as required.
   2. Provide construction dumpsters. Do not intermingle trash with school dumpsters.
   3. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   4. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Substantial Completion.

B. Final Completion.

C. Punch List.

D. Warranties.

E. System startup.

F. Adjusting.

G. Cleaning prior to Substantial Completion review.

H. Final Cleaning.

I. Maintenance.

1.02 RELATED REQUIREMENTS

A. Section 01 13 31 - Certificate of Compliance.

B. Section 01 13 32 - Certificate of No Hazardous Materials.

C. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance (O&M) data, warranties and bonds.

D. Section 01 79 00 - Demonstration and Training: Requirements relating to Owner training prior to Closeout.

1.03 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting review for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.
   1. In progress payment request coincident with or first following date claimed, show either 100 percent completion for portion of work claimed as "substantially complete", or list incomplete items, value of incompletion, and reasons for being incomplete. Include supporting documentation for completion as indicated in these contract documents.
      a. Submit statement showing accounting of changes to the Contract Sum.
      b. 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 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. Submit completed Certificate of Compliance. Refer to Section 01 13 31.
   6. Submit completed Certificate of No Hazardous Materials. Refer to Section 01 13 32.
   7. Prepare and submit drafts for Operation and Maintenance Manuals.
   8. Prepare and submit drafts for Project Record Documents.
   9. Prepare and submit damage or settlement surveys, property surveys, and similar final record information.
   10. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable. Submit an itemized receipt, signed by Owner, to Architect.
   11. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

12. Terminate and remove temporary facilities from Project site, along with mock-ups, construction tools, and similar elements.
13. Advise Owner of changeover in heat and other utilities.
14. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
15. Complete final cleaning requirements, including touchup painting.
16. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
17. Make submittals that are required by governing or other authorities.
    a. Provide copies to Architect and Owner.
    b. Provide copy of Occupancy Permit to Architect and Owner.

B. Review: Submit a written request for review for Substantial Completion. On receipt of request, Architect will either proceed with review or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after review 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. Results of completed review will form the basis of requirements for Final Completion.
    2. Should the Architect have to perform any additional reviews due to failure of Work to comply with claims of completion made by Contractor, the cost for each additional review will be charged to the Owner at the Architect/Engineer's hourly rate. The Owner shall have the right to deduct such charges from the contract amount as provided in the Conditions of the Contract.

1.04 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final review for determining final completion, complete the following:
    1. Submit a final Application for Payment with final waivers according to Section 01 20 00 - Price and Payment Procedures.
        a. Submit updated final statement, accounting for additional (final) changes to Contract Sum.
    2. Submit consent of surety.
    3. Prepare and submit final Project Record Documents within 30 days after date of Substantial Completion or before final completion, whichever occurs first.
    4. Submit final warranties.
    5. Submit final operation and maintenance manuals.
    6. Submit certified copy of Architect's Substantial Completion review list of items to be completed or corrected (punch list). The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
    7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
    8. Submit permanent Certificate of Occupancy.
    9. Submit payment and release of liens to requirements of General Conditions. Before final payment, the Contractor shall furnish the following to the Architect:
        a. An affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner of property might in any way be responsible, have been paid or otherwise satisfied (use AIA Form G706 or approved).
        b. An affidavit from each Subcontractor on AIA Form G706 or approved.
        c. Letter from Bonding Company addressed to Owner but submitted to the Architect, approving release of final payment and waiving submission of final receipts as well as a statement confirming the extension of the Bond for the warranty period as specified. Final receipts from all Subcontractors and material and equipment suppliers may be required to furnish to the Owner by the Contractor if the Surety does not waive this requirement. Letters to be in substantially the following form:
            1) (Name of Owner)Re: (Bond No.)
            2) (Address)(Name of Contractor)

3) (Name of Project)
4) Gentlemen:
5) The (Name of Bonding Company), surety on the above named Bond, consents to payment of retained percentages and agrees to waive submission of final receipts.
6) It is also agreed that the final payment to the Contractor shall not relieve the Surety Company of any of its obligations and that the Bond is extended to include guarantees and warranties of workmanship and materials.
7) (NAME OF BONDING COMPANY)
8) Attorney-in-Fact

d. Submit Contractor's Affidavit of Release of Liens (AIA Form G706A).
e. Return all copies of the Drawings and Specifications in accordance with the General Conditions.

10. Submit Affidavit of Wages Paid for Contractor and all sub-contractors.
11. Submit Department of Revenue Release (for projects over $35,000 only).
12. Complete startup testing of systems.
13. Submit test/adjust/balance records.
14. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
15. Submit attendance record for training of Owner's personnel.
16. Complete requirements of Section 01 78 00 - Closeout Submittals.
17. Complete requirements of Section 01 79 00 - Demonstration and Training.

B. Review: Submit a written request for final review for acceptance. On receipt of request, Architect will either proceed with review or notify Contractor of unfulfilled requirements. Architect will either prepare a letter to Owner recommending final acceptance or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Additional Reviews: Request an additional review when the Work identified in previous reviews as incomplete is completed or corrected.
2. Should the Architect have to perform any such additional reviews due to failure of Work to comply with claims of completion made by Contractor, the cost for each additional review will be charged to the Owner at the Architect/Engineer's hourly rate. The Owner shall have the right to deduct such charges from the contract amount as provided in the Conditions of the Contract.
3. Provide additional cleaning services as required for Work which was not complete at the time of initial review. Reclean as required until all Work is fully complete and recommended for final acceptance by Architect.
4. If the Work does not achieve Final Completion within two weeks of the date originally scheduled to do so, plus any time adjustments by Change Order, the Architect's time and efforts beyond that period shall constitute extra services, the cost of which at the Architect's standard hourly rates will be deducted from the Contractor's Final Payment or retainage by the Owner.
5. Punch list items in the Schedule of Values will be released on any given line item only when all punchlist items relating to that line item are satisfactorily completed.

1.05 CONTRACTOR'S LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Prior to requesting review for Substantial Completion, perform a thorough punch list of the project identifying incomplete items, damaged items and substandard items requiring correction.
1. Distribute the Punch List to applicable subcontractors and indicate corrections made to each item.
2. Reinspect and sign off on all complete items.
3. This Punch List will form the basis of the list to be submitted with the request for Substantial Completion.
4. Supplement Punch List with valuation of incomplete items and reasons for being incomplete.

5. Prepare Punch List in digital format acceptable to Architect.

B. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
   1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
   2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
   3. Include the following information at the top of each page:
      a. Project name.
      b. Date.
      c. Name of Architect.
      d. Name of Contractor.
      e. Page number.
   4. Submit list of incomplete items in the following format:
      a. PDF electronic file.

1.06 WARRANTIES

A. Submittal Time:
   1. Submit summary of warranties included in the bid within seven days after Notice of Intent to Award Contract (Prior to Execution of the Contract). Indicate duration of each warranty and start date.
   2. Submit sample warranties as part of the project submittal process.
   3. Submit final warranties before requesting review for final acceptance.

B. Comply with requirements of Section 01 78 00 - Closeout Submittals.

PART 2 PRODUCTS

2.01 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

3.01 SYSTEM STARTUP

A. Coordinate schedule for start-up and functional testing of various equipment and systems.

B. Notify Architect and Owner seven days prior to start-up of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify that wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

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

H. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

I. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.02 ADJUSTING

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

B. Testing, adjusting, and balancing HVAC systems: See requirements of Division 23.

3.03 CLEANING PRIOR TO SUBSTANTIAL COMPLETION REVIEW

A. At time of project close-out, clean or reclean the Work to the condition expected from a normal, commercial building cleaning and maintenance program.

B. Complete the following cleaning operations before requesting the Architect's review for certification of Substantial Completion.
   1. Remove grease, dust, dirt, stains, manufacturer's labels, fingerprints, etc., from sight exposed surfaces.
   2. Remove non-permanent protection and labels.
   3. Wash and polish all interior and exterior glazing and mirrors.
   4. Repair, patch and touch-up marred surfaces.
   5. Clean heating and cooling ducts, blowers, coils, fixtures, equipment, piping, and grilles.
   6. Replace disposable air filters and clean permanent filters.
   7. Remove construction debris.
   8. Flush water systems and disinfect domestic water lines. Sanitize plumbing and food service facilities.
   9. Broom clean new exterior paved surfaces and walks. Vacuum clean interior carpeted surfaces and wet mop hard floor surfaces.
   10. Clean light fixtures and replace burned-out lamps and replace damaged lenses.
   11. Police yards and grounds.

3.04 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and anti-pollution 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 review 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 other required labels and identification, including mechanical and electrical nameplates.
m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
n. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
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 grilles.
q. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter upon inspection.
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 fixtures to comply with requirements for new fixtures.
s. Leave Project clean and ready for occupancy.

2. Maintain in cleaned condition until Final Completion or Owner occupancy.

3.05 MAINTENANCE

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

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

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

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

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

END OF SECTION

SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Section 01 77 00 - Closeout Procedures: Contract closeout procedures.

C. Individual Product Sections: Specific requirements for operation and maintenance data.

D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Record Drawings:
   1. Draft: Submit one copy of marked-up record prints in electronic color PDF format prior to request for review for Substantial Completion.
   2. Final: Submit one paper copy set and an electronically scanned copy of marked up prints within 30 days of dated established for Substantial Completion or prior to request for review for final completion, whichever occurs first.
   3. Approved permit set of plans.

B. Record Specifications:
   1. Draft: Submit one copy of marked-up copy of Project Manual in electronic color PDF format prior to request for review for Substantial Completion.
   2. Final: Submit one copy of marked-up copy of Project Manual and one electronically scanned copy within 30 days of date established for Substantial Completion or prior to request for review for final completion, whichever occurs first.

C. Operation and Maintenance Manuals:
   1. Draft: Submit one copy of draft manuals in electronic color PDF format prior to request for review for Substantial Completion. Architect will review draft and return one copy with comments. Revise content of all document sets as required prior to final submission.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Final: Submit two sets of revised Manuals and an electronically scanned copy in final form prior to request for review for final completion.

D. Warranties and Bonds:
   1. Submit a summary of warranties included in the bid within seven days after Notice of Intent to Award Contract (Prior to Execution of the Contract). Indicate duration of each warranty and start date.
   2. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   3. Draft: Submit as part of normal submittal process.
   4. Final: Submit final forms of warranties prior to request for review for final completion.

E. PDF Format: Submit searchable PDF electronic files. File names shall clearly identify the Owner, project name, drawing or specification number and name and date. File name shall be established to list in the same order as identified in the Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and Construction Change Directives.
   5. ASIs and responses to RFIs.
   6. Reviewed shop drawings, product data, and samples.
   7. Manufacturer's instruction for assembly, installation, and adjusting.
   8. Architect will provide one hard copy and one PDF electronic file of a conformed set of Contract Documents, incorporating addenda for use by Contractor in developing Record Drawings.

B. The record documents shall include all disciplines of work whether changes occur or not. These documents, as well as the approved permit set of plans, shall be available to the Architect and Owner at the site and reviewed with them on a monthly basis. Satisfactory maintenance of up-to-date record drawings on a monthly basis will be a requirement for approval of progress payments.

C. Store record documents 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.

D. Record Drawings:
   1. 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 Addenda.
      k. Changes made by Change Order or Construction Change Directive.
      l. Changes made following Architect's written orders, including ASIs and responses to RFIs.
      m. Details not on the original Contract Drawings.
      n. Field records for variable and concealed conditions.
      o. Record information on the Work that is shown only schematically.
   2. Record drawings shall include, as a minimum, the location and performance data on each piece of equipment, general configuration of duct and pipe distribution system, including sizes, and the terminal air and water design flow rates.
   3. Mark the Contract Drawings and Shop Drawings completely and accurately. Utilize personnel proficient at recording graphic information in production of marked-up record prints.
   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. Mark revisions and/or clarifications issued by Addenda, ASI, Construction Change Directive, Change Orders or responses to RFIs to reflect the change. Each such revision

shall be graphically depicted to represent physical construction and clearly noted with the applicable Addenda, ASI, Change Order or RFI number. Notation of the Addenda, RFI, ASI, Construction Change Directive or Change Order number alone will not be acceptable.

7. Ensure entries are complete and accurate, enabling future reference by Owner.
8. Scanned Drawings: After review of draft drawings by Architect, incorporate necessary changes and prepare a full set of scanned Contract Drawings and Shop Drawings on CD-ROM.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
   2. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
   3. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals.
   4. Mark revisions and/or clarifications issued by Addenda, ASI, Construction Change Directive, Change Orders or responses to RFIs to reflect the change. Each such revision shall be graphically depicted to represent physical construction and clearly noted with the applicable Addenda, ASI, Change Order or RFI number. Notation of the Addenda, RFI, ASI, Construction Change Directive or Change Order number alone will not be acceptable.
   5. Format: Submit record Specifications as scanned PDF electronic file(s) of marked up paper copy of Specifications.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
   1. 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 and drawing or schedule designation or identifier where applicable.
   2. Product data, with catalog number, size, composition, and color and texture designations.
   3. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

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

D. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

E. Additional information as specified in individual product specification sections.

F. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

E. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

F. Provide servicing and lubrication schedule, and list of lubricants required.

G. Include manufacturer's printed operation and maintenance instructions.

H. Include sequence of operation by controls manufacturer.

I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

J. Provide control diagrams by controls manufacturer as installed.

K. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

L. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

M. Include test and balancing reports.

N. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; Project Number, Name of Design Firm, and subject matter of contents.

E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

H. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
   1. Text shall be minimum 12 point font size.

I. Drawings: Provide with reinforced punched binder tab. Bind in with text. 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.

J. Arrangement of Contents: Organize each volume in parts as follows:
   1. Project Directory.
   2. Table of Contents, of all volumes, and of this volume.
   3. Operation and Maintenance Data: Arranged by system, then by product category.
      a. Source data.
      b. Product data, shop drawings, and other submittals.
      c. Operation and maintenance data.
      d. Field quality control data.
      e. Photocopies of warranties and bonds.
   4. Design Data: To allow for addition of design data furnished by Architect or others, provide a tab labeled "Design Data" and provide a binder large enough to allow for insertion of at least 20 pages of typed text.

K. PDF Electronic File: After review of draft manuals, assemble each manual into a composite electronically-indexed file. Submit on digital media acceptable to Architect.
   1. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically-linked operation and maintenance directory.
   2. Enable inserted reviewer comments on draft submittals.
   3. File Names and Bookmarks: Enable bookmarking of individual documents based upon file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel upon opening file.

3.06 WARRANTIES AND BONDS

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

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

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

D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
   1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
   2. The Owner reserves the right to refuse to accept or pay for Work for the Project where a Special Warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

E. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

F. Verify that documents are in proper form, contain full information, and are notarized.

G. Co-execute submittals when required.

H. Retain warranties and bonds until time specified for submittal.

I. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.

J. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

K. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
   1. Product or work item.
   2. Installer of product or item, with name of principal, address, and telephone number.
   3. Describe the work provided by this installer/Subcontractor, under this Contract.
   4. Date of beginning of warranty or service and maintenance contract. (See General Condition's Warranty paragraph.)
   5. Duration of warranty or service maintenance contract.
   6. Information for Owner's personnel, including:
      a. Proper procedure in case of failure.
      b. Contact phone numbers of manufacturer.
   7. Instances that might affect validity of warranty or bond.
   8. Contractor, name of responsible principal, address, and telephone number.

L. Schedule of Warranties: Provide a summary schedule of start and end date of each warranty.

M. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION

SECTION 03 10 00
CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formwork for cast-in place concrete, with shoring, bracing and anchorage.

B. Openings for other work.

C. Form accessories.

D. Form stripping.

1.02 RELATED REQUIREMENTS

A. Section 03 20 00 - Concrete Reinforcing.

B. Section 03 30 00 - Cast-in-Place Concrete.

1.03 REFERENCE STANDARDS

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.

B. ACI 301 - Specifications for Structural Concrete.

C. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.

D. ACI 347R - Guide to Formwork for Concrete.

E. ASME A17.1 - Safety Code for Elevators and Escalators.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly and support of formwork. Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties.

1. Architect's review will be for aesthetic review of the tie-hole patterns and panel joints only. Design and engineering of formwork are Contractor's responsibility.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design formwork under direct supervision of a Professional Structural Engineer experienced in design of concrete formwork and licensed in Oregon.

1.06 MOCK-UP

A. Construct a 4 foot by 4 foot mock-up of formwork for exposed interior concrete. Refer to Section 01 40 00 - Quality Requirements.

1. Include reinforcement, ties, and accessories specified in Section 03 20 00.
2. Provide concrete in accordance with provisions of Section 03 30 00.
3. Cure concrete in accordance with provisions of Section 03 30 00.

B. Locate mock-up where directed.

C. Mock-up may not remain as part of the Work.

PART 2 PRODUCTS

2.01 FORMWORK - GENERAL

A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.

B. Design and construct to provide resultant concrete that conforms to design with respect to shape, lines, and dimensions.

C. Chamfer outside corners of beams, joists, columns, and walls.

D. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.

E. Comply with relevant portions of ACI 347R, ACI 301, and ACI 318.

2.02 WOOD FORM MATERIALS

A. Softwood Plywood, PS 1, B-B Class 1 or better, mill oiled and edge sealed for concealed structural concrete.

B. Softwood Plywood: PS 1, B-B Medium Density Concrete Form Overlay, Class I for surfaces exposed to public view.

2.03 FORMWORK ACCESSORIES

A. Form Ties: Removable type, galvanized metal, fixed length, cone type, with waterproofing washer, 1 inch back break dimension, free of defects that could leave holes larger than 1 inch in concrete surface.

B. Form Release Agent: Capable of releasing forms from hardened concrete without staining or discoloring concrete or forming bugholes and other surface defects, compatible with concrete and form materials, and not requiring removal for satisfactory bonding of coatings to be applied.

C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
   1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

D. Reveal Strips: Wood or rubber strips, kerfed for ease of form removal.

E. Filler Strips for Chamfered Corners: Wood strip type; 1 by 1 inch size; maximum possible lengths.

F. Dovetail Anchor Slot: Galvanized steel, at least 22 gage, 0.0299 inch thick, foam filled, release tape sealed slots, anchors for securing to concrete formwork.

G. Flashing Reglets: Galvanized steel, at least 22 gage, 0.0299 inch thick, longest possible lengths, with alignment splines for joints, foam filled, release tape sealed slots, anchors for securing to concrete formwork.

H. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

I. Embedded Anchor Shapes, Plates, Angles and Bars: As indicated in Structural Notes.

J. Waterstops: Preformed mineral colloid strips, 3/4 inch thick, moisture expanding. Provide products from same manufacturer as sheet waterproofing, where applicable
   1. Available Products:
      a. Waterstop RX101 manufactured by Cetco: www.cetco.com.
      b. SuperStop WaterStop manufactured by Tremco: www.tremcosealants.com.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

K. EPS Geofoam: ASTM D6817 Foam-Control EPS treated by manufacturer with termite treatment for below grade applications, 3 year minimum field exposure. Refer to Structural Drawings for location of use.
   1. Available Products:
      a. AFM Corporation, Geofoam Type EPS 19 with 5.8 psi compressive Resistance at 1 percent deformation, minimum for use at typical floor areas.
      b. AFM Corporation, Geofoam Type EPS 29 with 10.9 psi compressive Resistance at 1 percent deformation, minimum for use at heavily loaded areas.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.02 ERECTION - FORMWORK

A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.
   1. At formwork for exposed concrete, lay out form ties in a regular pattern for aesthetic review and acceptance by the Architect.

B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
   1. Limit concrete surface irregularities, designated by ACI 347RA as abrupt or gradual, as follows:
      a. Class A, 1/8 inch for smooth-formed finished surfaces.
      b. Class C, 1/2 inch for rough-formed finished surfaces.

C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.

D. Align joints and make watertight. Keep form joints to a minimum.

E. Obtain approval before framing openings in structural members that are not indicated on drawings.

F. Coordinate this section with other sections of work that require attachment of components to formwork.

G. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from Architect before proceeding.

H. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

3.03 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

C. Do not apply form release agent where concrete surfaces will receive applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.04 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Provide formed openings where required for items to be embedded in passing through concrete work.

B. Locate and set in place items that will be cast directly into concrete.

C. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.

D. Install waterstops in accordance with manufacturer's instructions, so they are continuous without displacing reinforcement.

E. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.

F. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

3.05 FORM CLEANING

A. Clean forms as erection proceeds, to remove foreign matter within forms.

B. Clean formed cavities of debris prior to placing concrete.
   1. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
   2. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.06 FORMWORK TOLERANCES

A. Construct formwork to maintain tolerances required by ACI 117, unless otherwise indicated.

B. Construct and align formwork for elevator hoistway in accordance with ASME A17.1.

C. Camber slabs and beams in accordance with ACI 301.

3.07 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.

B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.

C. Do not reuse wood formwork more than 2 times for concrete surfaces to be exposed to view. Do not patch formwork.

3.08 FORM REMOVAL

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.
   1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
   2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

D. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

E. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

END OF SECTION

SECTION 03 20 00
CONCRETE REINFORCING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcing steel for cast-in-place concrete.

B. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS

A. Section 03 10 00 - Concrete Forming and Accessories.

B. Section 03 30 00 - Cast-in-Place Concrete.

1.03 REFERENCE STANDARDS

A. ACI 301 - Specifications for Structural Concrete.

B. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.

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

D. ASTM A704/A704M - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.

E. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.

F. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.

G. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

H. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel.

I. CRSI (DA4) - Manual of Standard Practice.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Placing drawings that detail fabrication, bending and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement. The steel reinforcement detailer shall generate all shop drawing bending and installation details from the structural and architectural drawings and specifications. The use of reproductions or photocopies of the contract drawings shall not be permitted.

1. Provide details of fabrication, bending and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include special reinforcement required for openings through concrete structures.
2. Shop drawing resubmittals shall clearly identify all revisions to previous submittals.
   a. Heavy ink clouded outlines (revision clouds) shall be drawn around revised areas of individual sheets.
   b. Architect/Engineer will not review information outside of revision clouds on resubmitted drawings.
3. Separate shop drawing submittal packages shall be made for each of the building sectors shown on the Contract Drawings. The submittal for each sector shall contain complete fabrication and installation/erection information for all elements within that sector. References to shop drawings contained in other shop drawing submittal packages shall not be permitted. Submittal packages for each sector shall be staggered at least 14 calendar days.

C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.

D. Welders' Certificates: Submit certifications for welders employed on the project, verifying AWS qualification within the previous 12 months.

E. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

B. Welding: Qualify procedures and personnel according to AWS D1.4/D1.4M, "Structural Welding Code--Reinforcing Steel."

PART 2 PRODUCTS

2.01 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
   1. Plain billet-steel bars.
   2. Unfinished.

B. Reinforcing Steel: ASTM A706/A706M, deformed low-alloy steel bars.
   1. Unfinished.

C. Reinforcing Steel: Deformed bars, ASTM A996/A996M Grade 60 (420), Type A.

D. Reinforcing Steel Mat: ASTM A704/A704M, using ASTM A615/A615M, Grade 60 (60,000 psi) steel bars or rods, unfinished.

E. Stirrup Steel: ASTM A1064/A1064M steel wire, unfinished.

F. Steel Welded Wire Reinforcement (WWR): Plain type; ASTM A1064/A1064M.
   1. Form: Flat Sheets.
   2. WWR Style: As indicated on drawings.

G. Joint Dowel Bars: ASTM A615/A615M, Grade 60 (420), plain-steel bars, cut bars true to length with ends square and free of burrs.

H. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch.
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
   3. Provide stainless steel components for placement within 1-1/2 inches of weathering surfaces.

2.02 RE-BAR SPLICING:

A. Coupler Systems: Mechanical devices for splicing reinforcing bars; capable of developing 1.25 fy of the steel reinforcing design strength in tension and compression.
   1. Products:
      a. Dayton Superior Corporation; Bar Lock Coupler System: www.daytonsuperior.com.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Dowel Bar Splicer with Dowel-Ins: Mechanical devices for connecting dowels; capable of developing 1.25 fy of the steel reinforcing design strength in tension and compression.
   1. Products:
      a. Dayton Superior Corporation; Dowel Bar Splicer D101A with Straight Dowel-In: www.daytonsuperior.com.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 FABRICATION

A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.

B. Welding of reinforcement is permitted only with the specific approval of Architect. Perform welding in accordance with AWS D1.4/D1.4M.

C. Locate reinforcing splices not indicated on drawings at point of minimum stress.
   1. Review locations of splices with Architect.

PART 3 EXECUTION

3.01 GENERAL

A. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

B. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
   1. Weld reinforcing bars according to AWS D1.4/D1.4M, where indicated.

C. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

D. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.02 PLACEMENT

A. Place, support and secure reinforcement against displacement. Do not deviate from required position.

B. Do not displace or damage vapor barrier.

C. Accommodate placement of formed openings.

D. Maintain concrete cover around reinforcing as indicated on Structural Drawings.

E. Conform to applicable code for concrete cover over reinforcement.

3.03 FIELD QUALITY CONTROL

A. An independent testing agency, as specified in Section 01 40 00, will inspect installed reinforcement for conformance to contract documents before concrete placement.

B. Refer to Section 03 30 00 - Cast-in-Place Concrete for scope of testing.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Floors and slabs on grade.

B. Concrete shear walls, elevator shaft walls, foundation walls, and mat foundations.

C. Joint devices associated with concrete work.

D. Concrete curing.

1.02 RELATED REQUIREMENTS

A. Section 03 10 00 - Concrete Forming and Accessories: Forms and accessories for formwork.

B. Section 03 20 00 - Concrete Reinforcing.

1.03 REFERENCE STANDARDS

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.

B. ACI 301 - Specifications for Structural Concrete.

C. ACI 302.1R - Guide to Concrete Floor and Slab Construction.

D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.

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

F. ACI 306R - Guide to Cold Weather Concreting.

G. ACI 308R - Guide to External Curing of Concrete.

H. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.

I. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.

J. ASTM C157/C157M - Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete.

K. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete.

L. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

M. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.

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

O. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.

P. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens).

Q. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete.

R. ASTM C150/C150M - Standard Specification for Portland Cement.

S. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.

T. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete.

U. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

V. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.

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

X. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.

Y. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete.

Z. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

AA. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete.

AB. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.

AC. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

AD. ASTM E1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers.

AE. ASTM E1155M - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers (Metric).

AF. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

AG. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

AH. SCAQMD 1113 - Architectural Coatings.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
   1. Provide design mixtures for each concrete mixture containing fly ash as a replacement for Portland cement or other Portland cement replacements and for equivalent concrete mixtures that do not contain Portland cement replacements.

C. Mix Design: Submit proposed concrete mix design.
   1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
   2. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing.
   3. Indicate proposed mix design conforms to fiber reinforcing manufacturer's written recommendations.
   4. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
   5. Indicate amounts of mixing water to be withheld for later addition at Project site.

D. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.

E. Floor surface flatness and levelness measurements to determine compliance with specified tolerances.

F. Minutes of preinstallation conference.

G. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Follow recommendations of ACI 306R when concreting during cold weather.

1.06 PREINSTALLATION CONFERENCE

A. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Section 01 30 00 - Administrative Requirements.
   1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
      a. Contractor's superintendent.
      b. Independent testing agency responsible for concrete design mixtures.
      c. Ready-mix concrete manufacturer.
      d. Concrete subcontractor.
   2. Review special inspection and testing and inspecting agency procedures for field quality control, mock-ups, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.07 MOCK-UP

A. Construct and erect mock-up panel for architectural concrete surfaces where indicated to receive special treatment or finish.
   1. Panel Size: 4 by 4 feet.
   2. Number of Panels: One.
   3. Locate where directed.
   4. Accepted mock-up panel is considered basis of quality for the finished work. Keep mock-up exposed to view for duration of concrete work.
   5. Mock-up may not remain as part of the Work.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Warrant floor covering installed over SC-1 against failure due to moisture vapor migration or moisture-borne contaminates for a period of 15 years from date of original installation.
   1. Warranty shall cover all labor and materials needed to replace floor covering that fails due to moisture vapor emission and moisture borne contaminates.

PART 2 PRODUCTS

2.01 FORMWORK

A. Comply with requirements of Section 03 10 00.

2.02 REINFORCEMENT MATERIALS

A. Comply with requirements of Section 03 20 00.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
   1. Acquire cement for entire project from same source.

B. Fine and Coarse Aggregates: ASTM C 33.
   1. Acquire aggregates for entire project from same source.

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

D. Calcined Pozzolan: ASTM C618, Class N.

E. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.

F. Water: Clean and not detrimental to concrete.

G. Early Age Crack-Control Fiber Reinforcement: ASTM C1116/C1116M. Refer to General Structural Notes for more information.

2.04 ADMIXTURES

A. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

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

C. Air Entrainment Admixture: ASTM C260/C260M.

D. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.

E. High Range Water Reducing Admixture: ASTM C494/C494M Type F.

F. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.

G. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.

H. Accelerating Admixture: ASTM C494/C494M Type C.

I. Retarding Admixture: ASTM C494/C494M Type B.

J. Water Reducing Admixture: ASTM C494/C494M Type A.
   1. Shall not increase concrete shrinkage or promote water-bleeding.

K. Shrinkage Reducing Admixture:
   1. ASTM C494/C494M, Type S.
   2. Manufacturers:
      a. GCP Applied Technologies; Eclipse: www.gcpat.com/concrete/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.
   3. Mixture of sufficient quantity to limit shrinkage to 0.045 percent as tested in accordance with ASTM C157/C157M, but no less than 1.0 gallons per cubic yard.
   4. Extent of Work: Provide for all uncovered interior concrete flatwork where polished concrete floor slabs POL-1 are scheduled. (Refer to future Bid Package)

2.05 ACCESSORY MATERIALS

A. Underslab Vapor Retarder: Sheet material complying with ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
   1. Installation: Comply with ASTM E1643.
   2. Perm Rating: 0.1 maximum.
   3. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
   4. Manufacturers:
      a. ISI Building Products; Viper VaporCheck II 15-mil (Class A): www.isibp.com/#sle.
      b. Poly-America; Husky Yellow Guard 15 Mil Vapor Barrier: www.yellowguard.com.
      c. Raven Industries; VaporBlock 15: www.vaporblock.com.
      d. Stego Industries, LLC; Stego Wrap Vapor Barrier (15 mil): www.stegoindustries.com/#sle.
      e. W. R. Meadows, Inc; PERMINATOR Class A - 15 mils: www.wrmeadows.com/#sle.
      f. Substitutions: See Section 01 60 00 - Product Requirements.

B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Grout: Comply with ASTM C1107/C1107M.
   2. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
   3. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.

C. Coatings, General: Provide products with VOC limits as established in SCAQMD 1113, Architectural Coatings.
   1. Floor Coatings: 50 g/L maximum.
   2. Sealers: 100 g/L maximum.
   3. Concrete Curing Compounds: 100 g/L maximum.
   4. Waterproofing Sealers: 100 g/L maximum.

D. Sealer SC-1: ASTM C1315, Type 1, Class A, ASTM C309, Type 1 Class A, penetrating product with no less than 34 percent solids content, leaving no sheen, VOC content rating as required to suit regulatory requirements with a 5 year documented history in controlling moisture vapor emission from damaging floor coverings.
   1. Products:
      a. Creteseal; SC2000: www.creteseal.com.
      b. Curranseal PMC3300: www.curranseal.com.

E. Sealer SC-2: Clear, chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; colorless; that penetrates, hardens, and densifies concrete surfaces.
   1. Products:
      a. Dayton Superior Corporation; Sure Hard Densifier J17: www.daytonsuperior.com.
      b. Euclid Chemical Company (The); Euco Diamond Hard: www.euclidchemical.com.
      c. L&M Construction Chemicals, Inc; Seal Hard: www.laticrete.com.
      d. Master Builders Solutions by BASF; MasterKure HD 300 WB: www.master-builders-solutions.basf.us.
      e. Meadows, W. R., Inc; Liqui-Hard: www.wrmeadows.com.
      f. US Mix Products Company; US Spec Industraseal: www.usspec.com.

2.06 BONDING AND JOINTING PRODUCTS

A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.

B. Epoxy Bonding System:
   1. Complying with ASTM C881/C881M and of Type required for specific application.

C. Waterstops: Preformed mineral colloid strips, 3/4 inch thick, moisture expanding. Provide products from same manufacturer as sheet waterproofing, where applicable.
   1. Available Products:
      a. Waterstop RX101 manufactured by Cetco: www.cetco.com.
      b. SuperStop WaterStop manufactured by Tremco: www.tremcosealants.com.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

D. Reglets: Formed steel sheet, galvanized, with temporary filler to prevent concrete intrusion during placement.
   1. Size: As indicated on drawings.

E. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
   1. Material: ASTM D1751, cellulose fiber.

F. Thermal Break: 1-inch thick extruded polystyrene foam insulation.
   1. Compressive Strength: 30 psi.
   2. R-Value: 5.0.
   3. Available Product: Dow Chemical Company; Styrofoam Brand SM: www.dow.com.

G. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches on center; ribbed steel stakes for setting.
   1. Provide removable plastic cap strip that forms wedge-shaped joint for sealant installation.
   2. Height: To suit slab thickness.

2.07 CURING MATERIALS

A. Moisture-Retaining Sheet: ASTM C171.
   1. Curing paper, regular or white.
   2. Polyethylene film, white or clear, minimum nominal thickness of 0.0040 inch.
   3. White-burlap-polyethylene sheet, weighing not less than 10 ounces per linear yard, 40 inches wide.

B. Water: Potable, not detrimental to concrete.

2.08 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
   1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of trial mixtures, as specified in ACI 301.
   1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

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

D. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.

E. Normal Weight Concrete: Refer to Structural Drawings.

2.09 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Verify that forms are clean before applying release agent.

B. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

C. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
   1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
   2. Use latex bonding agent only for non-load-bearing applications.

D. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

E. Install vapor retarder under interior slabs on grade according to ASTM E1643 and manufacturer's written instructions. Lap joints minimum 12 inches and seal watertight by taping edges and ends with manufacturer's recommended tape. Use vapor retarder sheet to boot around all penetrations and seal with tape to create a continuous vapor retarder. Do not penetrate vapor retarder with screed pins, wood stakes or other items.
   1. Place vapor retarder under the entire soil-contact area of the floor in a manner that minimizes the required number of joints and seams. Take care to prevent damage to the membrane during the construction process.
   2. Where the slab edge is cast against a foundation wall or grade beam, install the membrane to seal to the foundation element.
   3. Fit membrane to all penetrations to within 1/2 inch of the penetration and seal with tape or mastic.

4. Repair all damaged portions of the membrane with tape or with a patch made from the same or compatible material as the membrane, cut so as to provide a minimum 12-inch lap from any opening and taped continuously about its perimeter.

3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Notify Architect not less than 24 hours prior to commencement of placement operations.

D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

E. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

F. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.

G. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer. Where approved, record the amount of water added on site and provide with the special inspection reports.
   1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

H. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
   1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
   2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
   3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

I. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
   1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   2. Maintain reinforcement in position on chairs during concrete placement.
   3. Screed slab surfaces with a straightedge and strike off to correct elevations.
   4. Slope surfaces uniformly to drains where required.
   5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

J. Cold-Weather Placement: Comply with ACI 306R and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
   1. When average high and low temperature is expected to fall below 40 degrees F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
   2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

K. Hot-Weather Placement: Comply with ACI 305R and as follows:
1. Maintain concrete temperature below 90 degrees F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

L. Protect all uncovered interior concrete flatwork where polished concrete finishes are scheduled from wind by providing curtains adjacent to areas being placed.

M. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.04 SLAB JOINTING

A. Locate joints as indicated on the drawings.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab or thermal breaks as detailed.

D. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

E. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-third of concrete thickness as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws as indicated below. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
   a. Equipment Control Joint Saw: "Soff-Cut System," early-entry dry-cut saw with Skid Plate, by Soff-Cut. 1112 Olympic Drive, Corona, CA 92881 909-272-2330.
   b. Comply with the Soff-Cut instructions for the SOFF-CUT System
   c. Troweled Finish: Install cuts 0 to 2 hours after final finish at each joint location.
   d. Broom Finish: Install cuts at each control joint location as soon as concrete will support weight of saw and operator without disturbing final finish.
   e. Cut depth not less than 10 percent of slab thickness with a 1-inch minimum.
   f. Remove debris in path of cut and under Skid Plate before cutting. Skid Plate must remain flat on surface.
   g. Use Soff-Cut blades and Skid Plates, using a new Skid Plate with each new blade.

h. Install Soff-Cut joint protector at saw-cut intersection prior to cross-cut.
i. Remove dry powder without disturbing finish.
j. Avoid traffic across saw cut until sufficient strength is gained to protect joint edges.
k. Coordinate with Work of Section 03 35 43 - Polished Concrete Finishing for placement of contraction joints within areas to receive polished finish. (Refer to a future Bid Package)

F. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Section 07 92 00 - Joint Sealants are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
4. At slab edges on grade, install thermal breaks where detailed in lieu of joint-filler strips. Allow for installation of backer rod and sealant flush with top of slab.

G. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

H. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.05 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. An independent testing agency, as specified in Section 01 40 00, will inspect finished slabs for conformance to specified tolerances.

B. For floors below wood athletic flooring, provide surface flatness of +/- 1/8 inch in a 10 foot radius.
1. Coordinate with Work of Section 09 64 66 - Wood Athletic Flooring for depth of recess to receive athletic flooring.
2. Correct the slab surface if tolerances are less than specified.
3. Grind high spots and fill low spots with approved leveling compound.

C. Maximum Variation of Surface Flatness at Upper Levels:
1. Exposed Concrete Floors: 1/8 inch in 10 feet.
2. Under Seamless Resilient Flooring: 1/8 inch in 10 feet.
3. Under Carpeting: 1/8 inch in 10 feet.

D. Correct the slab surface if tolerances are less than specified.

E. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
1. Exposed to View and Foot Traffic: F(F) of 20; F(L) of 15, on-grade only.
2. Under Carpeting and Entry Mats: F(F) of 25; F(L) of 20, on-grade only.
3. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25, on-grade only.
4. Polished Concrete Finish: F(F) of 40; F(L) of 25, on-grade only.
5. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155 (ASTM E1155M), within 48 hours after slab installation; report both composite overall values and local values for each measured section.

F. Correct defects by grinding if affected area is concealed from view. If not concealed, removal and replacement of the defective work is required. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.06 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.

C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
   1. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
      a. Apply to concrete surfaces exposed to public view.

D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
   1. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include thin set ceramic tile, resilient flooring, carpeting, and entry mat.
   2. Polished Concrete Floors: Trowel as described in ACI 302.1R; use steel-reinforced plastic trowel blades instead of steel blades to avoid black-burnish marks; decorative exposed surfaces include surfaces to be polished.
      a. Refer to Section 03 35 43 - Polished Concrete Finishing (To be issued as Work of a future Bid Package).
   3. Exterior Steps and Ramps: "Broom Finish." Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
   4. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1/4 inch per foot or as indicated on drawings.

3.07 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.08 CURING AND PROTECTION

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

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
   1. Normal concrete: Not less than seven days.
   2. High early strength concrete: Not less than four days.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

D. Surfaces Not in Contact with Forms:
   1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
      a. Ponding: Maintain 100 percent coverage of water over floor slab areas, continuously for 4 days.

b. Spraying: Spray water over floor slab areas and maintain wet.
c. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.

2. Final Curing: Begin after initial curing but before surface is dry.
a. Moisture-Retaining Sheet: Lap strips not less than 3 inches and seal with waterproof tape or adhesive; secure at edges.

E. Sealer Application: Comply with manufacturer's recommendations.
1. Sealer SC-1: Apply sealer the day of the concrete pour just after final finishing and soff cutting. Apply with a low-pressure industrial sprayer at 200 square feet per gallon. After the concrete sealer is applied, broom evenly across the concrete slab until completely absorbed into the concrete surface.
a. Locations of Use: All areas scheduled or indicated to receive resilient flooring, carpeting, and entry mats.
b. Verify with resilient flooring manufacturers that sealer is compatible with flooring and adhesive materials prior to application.
2. Sealer SC-2: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
a. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
b. Do not apply to concrete that is less than three days' old.
c. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.
d. Locations of Use: At floors exposed to view, unless indicated otherwise.
1) Do not apply to floors indicated to be polished.

3.09 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part Portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete, but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that

penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.10 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.

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

C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.

E. Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

F. Inspections:
   1. Steel reinforcement placement.
   2. Steel reinforcement welding.
   3. Headed bolts and studs.
   4. Verification of use of required design mixture.
   5. Concrete placement, including conveying and depositing.
   6. Curing procedures and maintenance of curing temperature.
   7. Verification of concrete strength before removal of shores and forms from beams and slabs.

G. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C172/C172M 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 C143/C143M; 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 C231, pressure method, for normal-weight concrete; 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 C1064/C1064M; one test hourly when air temperature is 40 degrees F and below and when 80 degrees F and above, and one test for each composite sample.
   5. Compression Test Specimens: ASTM C31/C31M. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
   6. Compressive-Strength Tests: ASTM C39/C39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
      a. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
   7. Strength of each concrete mixture will be satisfactory if every 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 500 psi.
   8. 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.
   9. 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.
   10. 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. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders or by other methods as directed by Architect.
   11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
   12. Correct deficiencies in the Work that test reports and inspections indicate does not comply with the Contract Documents.

H. Measure floor and slab flatness and levelness according to ASTM E1155 within 48 hours of finishing.

3.11 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

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

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

3.12 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

B. For concrete floors indicated to remain exposed to view, protect to prevent damage, including staining, gouges and scratching by construction traffic and activities.
   1. Inspect tires for debris prior to use on slab. Remove embedded items which may cause damage to the floor slab.
   2. Clean up spills on slab immediately.

C. Develop a concrete protection procedure which addresses the following:
   1. Communication of protection plan to subcontractors and vendors.
   2. Procedures for cleaning spills, including use of and availability of cleaning chemicals and absorptive materials at site.

END OF SECTION

SECTION 07 13 00
SHEET WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sheet Waterproofing WP-1:
   1. Composite HDPE/Bentonite sheet membrane.

B. For the following applications:
   1. Elevator pits.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete substrate.

B. Section 07 14 00 - Fluid-Applied Waterproofing: WP-2.

1.03 REFERENCE STANDARDS

A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension.

B. ASTM D4833/D4833M - Standard Test Method for Index Puncture Resistance of Geomembranes, and Related Products.

C. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.

D. NRCA (WM) - The NRCA Waterproofing Manual.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for membrane and recommended accessories.

C. Shop Drawings: Provide project specific drawings. Indicate special joint or termination conditions, all conditions of interface with other materials and penetrations.

D. Certificate: Certify that products meet or exceed specified requirements.

E. Preconstruction Test Reports: For water samples taken at Project site along with recommendations resulting from these tests.

F. Manufacturer's Statement: Waterproofing manufacturer's representative's written statement confirming that the waterproofing assembly has been installed according to applicable manufacturer's specifications and details, and is eligible for manufacturer's warranty.
   1. Statement must be submitted prior to covering of waterproofing Work.

G. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Membrane Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience and approved by manufacturer.

C. Water Sample Test: Test a project site water sample, supplied to manufacturer by waterproofing contractor, to determine type of bentonite system (standard sodium bentonite or contaminate resistant sodium bentonite) to be utilized on the project. Manufacturer shall conduct test free of charge. Contractor is responsible for collection and shipment of one liter of actual site water, or, if water is not present at the site, one quart of earth from the lowest level on-site to be waterproofed. Water or earth should be shipped in uncontaminated, sealed

plastic container to location identified by the manufacturer. Provide project name, city and state along with return address to forward test results.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Maintain bentonite products dry. Protect with waterproof cover.

B. Store materials in a dry, well-ventilated space.

C. Remove and replace bentonite materials that have been prematurely exposed to moisture.

1.07 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until liquid or mastic accessories have cured.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Contractor shall correct defective Work within a five year period after Date of Substantial Completion; remove and replace materials concealing waterproofing at no extra cost to Owner.

C. Provide 10 year manufacturer warranty for waterproofing failing to resist penetration of water.

PART 2 PRODUCTS

2.01 WATERPROOFING APPLICATIONS

A. Composite HDPE/Bentonite Sheet Membrane:
   1. Location: Elevator pits.
   2. Horizontal Surfaces: Loose-laid.

2.02 MEMBRANE MATERIALS

A. Composite HDPE/Bentonite Sheet Membrane WP-1: Comprised of black/grey HDPE and granular bentonite with spun polypropylene fabric facing.
   1. Sheet Width: 4 feet, minimum.
   2. Tensile Strength: 4,000 psi, measured in accordance with ASTM D412.
   3. Ultimate Elongation: 500 percent, measured in accordance with ASTM D412.
   4. Puncture Resistance: 36.67 lb/ft, measured in accordance with ASTM D4833/D4833M.
   5. Water Vapor Permeability: 0.03 perm inch, measured in accordance with ASTM E96/E96M.
   6. Manufacturers:
      a. Carlisle; MiraCLAY: www.carlisleccw.com.
      b. CETCO; Voltex DS: www.cetco.com.
      c. Tremco Commercial Sealants & Waterproofing; Paraseal LG: www.tremcosealants.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Bentonite: Granulated pure, dry, bentonite clay comprised of 90 percent minimum sodium montmorillonite; 90 percent minimum passing No. 20 mesh sieve and 10 percent maximum passing No. 200 mesh sieve.
   1. Products:
      a. Carlisle; CCW MiraCLAY Granules.
      b. CETCO; Waterstoppage.
      c. Tremco; Paragranular.

C. Polyethylene Sheet: 6 mil thick.

D. Seaming Materials: As recommended by membrane manufacturer.

E. Membrane Sealant: As recommended by membrane manufacturer.

2.03 ACCESSORIES

A. Waterstop: Flexible strip of bentonite waterproofing compound in coil form; designed specifically for vertical and horizontal joints in concrete construction.
   1. Products:
      a. Carlisle; CCW MiraSTOP.
      b. CETCO; Waterstop-RX.
      c. Tremco; SuperStop WaterStop.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions are acceptable prior to starting this work.

B. Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of waterproofing system.

C. Verify items that penetrate surfaces to receive waterproofing are securely installed.

3.02 PREPARATION

A. Protect adjacent surfaces from damage not designated to receive waterproofing.

B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions.

C. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer.

3.03 INSTALLATION - MEMBRANE

A. Install membrane waterproofing in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.

B. Seal construction joints with waterstop.

C. Overlap edges and ends, minimum 4 inches, seal permanently waterproof by method recommended by manufacturer, and apply uniform bead of sealant to joint edge.

D. Weather lap joints on sloped substrate in direction of drainage, and seal joints and seams.

3.04 APPLICATION - BELOW SLABS

A. Below Structural Slabs-on-Grade: Apply waterproofing membrane with HDPE side down and staple ends and edges.
   1. Install under elevator pit to extent indicated. Lap over edge of underslab vapor retarder
   2. Protect waterproofing from damage caused by reinforcing bar supports with sharp edges.

B. Lap joints 4 inches. Secure laps to prevent displacement.

C. Lay joint seal continuously along and around protrusions and penetrations. Fill around penetrations with bentonite granules. Secure to prevent movement.

3.05 FIELD QUALITY CONTROL

A. Inspection: Arrange for manufacturer's representative to inspect completed waterproofing installation before covering with other construction and provide written report that installation complies with manufacturer's written instructions.
   1. Remove and replace applications of bentonite waterproofing where inspection indicates that it does not comply with specified requirements.

3.06 PROTECTION

A. Do not permit traffic over unprotected or uncovered membrane.

B. Protect waterproofing from damage and wetting before and during subsequent construction operations. Repair punctures, tears, and cuts according to manufacturer's written instructions.

C. Cover installed waterproofing with temporary polyethylene sheeting. Remove sheeting just before backfilling begins.

END OF SECTION

SECTION 07 14 00
FLUID-APPLIED WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fluid-Applied Waterproofing WP-2:
   1. Polyurethane waterproofing.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete substrate.

B. Section 07 13 00 - Sheet Waterproofing: WP-1.

C. Section 07 21 00 - Thermal Insulation: Insulation installed over drainage panels.

D. Section 33 46 00 - Subdrainage: Foundation drainage. (Issued as Work of Bid Package 1)

1.03 REFERENCE STANDARDS

A. ASTM C836/C836M - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.

B. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension.

C. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness.

D. ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.

E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.

F. NRCA (WM) - The NRCA Waterproofing Manual.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for membrane, flexible flashings, and drainage board.
   1. Include manufacturer's written instructions for evaluating, preparing and treating substrates.

C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.
   1. Show locations and extent of waterproofing.
   2. Include project specific details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

D. Preconstruction Field Test Reports: Indicate which primer and surface preparation methods resulted in optimum adhesion to substrates based on preconstruction testing.

E. Certificate: Certify that products meet or exceed specified requirements.

F. Manufacturer's Installation Instructions: Indicate special procedures.

G. Manufacturer's Field Reports: Indicate directions given and revisions made. Confirm that installation is in compliance with manufacturer's recommendations. Refer to Field Quality Control Article.

H. Warranty:
   1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
   2. Submit installer's certification that installation complies with warranty conditions for the waterproofing membrane.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience and approved by manufacturer.

C. Preconstruction Field Testing: Before installing waterproofing, perform field test for adhesion to Project substrates as follows:
   1. Conduct tests for each type of substrate as found on-site. Determine if primer is required. If so, re-test using primer.
   2. Notify Architect 72 hours in advance of dates and times when waterproofing will be tested.
   3. Arrange for tests to take place with manufacturer's technical representative present.
   4. Report whether waterproofing failed to adhere to substrates or tore cohesively.

D. Manufacturer: Make tests determining compatibility of waterproofing with substrates and other adjacent flashings as necessary to conform to manufacturer's Warranty provisions and project requirements.

E. Inspection: Prior to, during installation and at completion of installation, conduct inspections by the membrane manufacturer's field representative to ascertain that the waterproofing system meets the manufacturer's published specifications, standards and details.

1.06 MOCK-UP

A. Construct mock-up consisting of 100 sq ft of horizontal waterproofed panel; to represent finished work including internal and external corners, drainage panel, base flashings, control joints, and counterflashings.

B. Locate where directed.

C. Mock-up may remain as part of this Work.

1.07 PREINSTALLATION CONFERENCE

A. Preinstallation Meeting: Convene a meeting at least one week prior to starting work; require attendance of manufacturer's representative and affected installers; invite Architect and Owner.
   1. Review waterproofing requirements including, but not limited to, the following:
      a. Surface preparation specified in other Sections.
      b. Minimum curing period.
      c. Forecasted weather conditions.
      d. Special details and sheet flashings.
      e. Repairs.

1.08 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until cured.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Manufacturer's Warranty: Provide manufacturer's warranty for waterproofing failing to resist penetration of water, including adhesive failure, cohesive failure and waterproofing failure resulting from substrate cracking up to 1/16-inch.
   1. Warranty Period: Ten years from Date of Substantial Completion.

C. Installer's Warranty: Submit Installer's warranty, on Installer's standard or customized form, signed by Installer, covering the Work of this Section for the following warranty period.
   1. Warranty Period: Two years from Date of Substantial Completion.
   2. Warranty includes removing and reinstalling overburden in order to repair membrane.

PART 2 PRODUCTS

2.01 WATERPROOFING APPLICATIONS

A. Polyurethane Waterproofing:
   1. Location: Foundation walls and footings.
   2. Cover with protection course and drainage panel.

2.02 MEMBRANE AND FLASHING MATERIALS

A. Polyurethane Waterproofing WP-2: Cold-applied one component polyurethane, complying with ASTM C836/C836M.
   1. Cured Thickness: 120 mils, 0.12 inch, minimum.
   2. Suitable for installation over concrete and masonry substrates.
   3. VOC Content: VOC Compliant.
   4. Tensile Strength: 200 psi, measured in accordance with ASTM D412.
   5. Ultimate Elongation: 600 percent, measured in accordance with ASTM D412.
   6. Hardness: 85, measured in accordance with ASTM D2240, using Type A durometer.
   7. Permeability: 0.10 perm inch, measured in accordance with ASTM E96/E96M.
   8. Adhesion: Greater than 150 psi, measured in accordance with ASTM D4541.
   9. Products:
      a. Henry Company; Henry CM100: www.henry.com.
      b. Master Builders Solutions by BASF; MasterSeal HLM 5000: www.master-builders-solutions.basf.us.
      c. Tremco Commercial Sealants & Waterproofing; TREMproof 250GC: www.tremcosealants.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Flexible Flashings: Type recommended by membrane manufacturer.

C. Joint Cover Sheet: 1 inch thick elastic sheet material designated for and compatible with membrane.

2.03 ACCESSORIES

A. Primer: As recommended by waterproofing manufacturer for substrates found on site.

B. Epoxy Primer: Waterproofing manufacturer's recommended epoxy primer for use as a transition for any locations where an asphaltic membrane laps onto the waterproofing.

C. Surface Conditioner: Compatible with membrane compound; as recommended by membrane manufacturer.

D. Sealant for Joints and Cracks in Substrate: Type compatible with waterproofing material and as recommended by waterproofing manufacturer.

E. Protection Course: Non-biodegradable polyester protection mat or as recommended by membrane manufacturer.
   1. Available Products:
      a. Henry Company; Protection Fabric - GR08: www.henry.com.
      b. Tremco; Protection Mat; www.tremcosealants.com.
      c. Equal as approved by other named manufacturers.

F. Waterstop: Flexible strip of bentonite waterproofing compound in coil form; designed specifically for vertical and horizontal joints in concrete construction.
   1. Products:
      a. Henry Company; HF302 - Hydro-Flex Waterstop.
      b. Master Builders recommended waterstop.
      c. Tremco; SuperStop WaterStop.

G. Drainage Panel: Drainage layer with geotextile filter fabric on earth side.
   1. Composition: Dimpled polystyrene core; polypropylene or polyester filter fabric.
   2. Products:
      a. Henry Company; Henry DB 200: www.henry.com.
      b. Master Builders Solutions by BASF; MasterSeal 974: www.master-builders-solutions.basf.us.
      c. Tremco Commercial Sealants & Waterproofing; TREMDrain1000: www.tremcosealants.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

H. Cant Strips: Premolded composition material or sealant backer, as recommended by waterproofing manufacturer.

I. Counterflashings: As recommended by membrane and protection course manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.

C. Verify substrate surfaces are free of frozen matter, dampness, loose particles, cracks, pits, projections, penetrations, or foreign matter detrimental to adhesion or application of waterproofing system.

D. Verify that substrate surfaces are smooth, free of honeycomb or pitting, and not detrimental to full contact bond of waterproofing materials.

E. Verify items that penetrate surfaces to receive waterproofing are securely installed.

3.02 PREPARATION

A. Protect adjacent surfaces from damage not designated to receive waterproofing.

B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions.

C. Do not apply waterproofing to surfaces unacceptable to waterproofing manufacturer.

D. Fill non-moving joints and cracks with a filler compatible with waterproofing materials.

E. Seal moving cracks with sealant and non-rigid filler, using procedures recommended by sealant and waterproofing manufacturers.

F. Install cant strips at inside corners.

3.03 INSTALLATION

A. Install waterproofing to specified minimum thickness in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.

B. Apply primer or surface conditioner at a rate recommended by manufacturer, and protect conditioner from rain or frost until dry.

C. At joints and cracks less than 1/2 inch in width including joints between horizontal and vertical surfaces, apply 12 inch wide strip of joint cover sheet.

D. Center joint cover sheet over joints, roll sheet into 1/8 inch thick coating of waterproofing material and apply second coat over sheet extending at least 6 inches beyond sheet edges.

E. Apply extra thickness of waterproofing material at corners, intersections, and angles.

F. At locations where an asphaltic membrane laps onto the waterproofing, provide epoxy primer.

G. Flexible Flashings: Seal items watertight that penetrate through waterproofing membrane with flexible flashings.

H. Seal membrane and flashings to adjoining surfaces.
   1. Install counterflashing over exposed edges.

3.04 INSTALLATION - DRAINAGE PANEL

A. Install protection course over cured membrane.

B. Place drainage panel directly against protection course, butt joints, place to encourage drainage downward, and scribe and cut boards around projections, penetrations, and interruptions.
   1. Attach in accordance with waterproofing manufacturer's recommendations.

3.05 FIELD QUALITY CONTROL

A. Provide adhesion testing conducted by or in the presence of manufacturer's technical representative. Submit results to Architect.
   1. Perform adhesion cut tests on first completed 100 square feet. Then test one location for each 500 square feet of membrane thereafter.
   2. Maintain test log and submit to Architect with locations, dates, results, and remedial actions.

B. Manufacturer Field Inspection: Coordinate with manufacturer's technical representative to conduct periodic in-progress inspections to verify installation is in compliance with manufacturer's recommendations. Conduct a minimum of three field inspections.
   1. Prior to installation.
   2. During installation of membrane.
   3. Before covering membrane.
   4. Document site visits in writing with copy to Architect.

END OF SECTION

SECTION 07 21 00
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation at perimeter foundation wall.

1.02 REFERENCE STANDARDS

A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

C. SCAQMD 1168 - Adhesive and Sealant Applications.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, product limitations, and formaldehyde content.
   1. Provide documentation indicating levels of formaldehyde content and Greenguard Certification. Provide independent 3rd Party Verification.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Manufacturer's Installation Instructions: Include information on installation techniques.

1.04 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

B. Do not expose foam-plastic board to sunlight except to necessary extent for period of installation and concealment.

C. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation at Perimeter of Foundation: Extruded polystyrene (XPS) board.

2.02 FOAM BOARD INSULATION MATERIALS

A. Extruded Polystyrene (XPS) Board Insulation: Complies with ASTM C578 with either natural skin or cut cell surfaces.
   1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
   2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   4. Type and Thermal Resistance, R-value: Type IV, 5.0 (0.88) per 1 inch thickness at 75 degrees F mean temperature.
   5. Locations of Use:
      a. Perimeter foundation walls.
   6. Board Edges: Square.
   7. Type and Water Absorption: Type IV, 0.3 percent by volume, maximum, by total immersion.
   8. Thermal Resistance:
      a. Foundation Walls: R of 7.5.
   9. Products:
      a. Dow Chemical Company; STYROFOAM Square Edge: www.dowbuildingsolutions.com/#sle.
      b. Owens Corning Corporation; FORMULAR 250 Square Edge: www.ocbuildingspec.com/#sle.

c. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 ACCESSORIES

A. Adhesives, Sealants and Primers - General: Provide only products having lower volatile organic compound (VOC) content than required by SCAQMD 1168.

B. Seals and Sealants: Chemically and physically compatible with adjacent materials at locations to eliminate uncontrolled air leakage.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Comply with manufacturer's recommendations for application.

B. Apply adhesive to back of boards:

C. Install boards horizontally on foundation perimeter.
   1. Place boards to maximize adhesive contact.
   2. Install in running bond pattern.
   3. Butt edges and ends tightly to adjacent boards and to protrusions.
   4. Extend insulation a minimum of 24 inches or to frost line.

D. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

E. Immediately following application of board insulation, place protective boards over exposed insulation surfaces.

3.03 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 14 24 00
HYDRAULIC ELEVATORS
(Issued For Reference Only)

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Complete hydraulic elevator systems.
   1. Service type.

B. Elevator Maintenance Contract.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Includes elevator machine foundation and elevator pit.

B. Section 05 12 00 - Structural Steel Framing: Includes hoistway framing and overhead hoist beams.

C. Section 05 50 00 - Metal Fabrications: Includes elevator pit ladder, sump pit grates and frames, and safety beams.

D. Section 07 13 00 - Sheet Waterproofing: Waterproofing of elevator pit floor.

E. Section 09 21 16 - Gypsum Board Assemblies: Gypsum shaft walls.

F. Section 09 65 00 - Resilient Flooring: Floor finish in car.

G. Section 10 44 00 - Fire Protection Specialties: Fire extinguisher in elevator machine room.

H. Division 21 - Fire Suppression: Sprinkler heads in hoistway.

I. Division 22 - Plumbing.

J. Division 26 - Electrical: Electrical service for elevators including fused disconnect switches at machine room and provision for emergency power.

K. Division 27 - Communications: Telephone service to elevators.

L. Division 28 - Electronic Safety and Security: Smoke detectors in elevator lobbies to initiate emergency recall operation, heat detectors in shafts and machine rooms to disconnect power from equipment before sprinkler activation, connection to elevator controllers, access control for elevators and coordination with building fire alarm system.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.

B. AISC 360 - Specification for Structural Steel Buildings.

C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures.

D. ASME A17.1 - Safety Code for Elevators and Escalators.

E. ASME A17.2 - Guide for Inspection of Elevators, Escalators, and Moving Walks.

F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.

G. ASTM A139/A139M - Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over).

H. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes.

I. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

J. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

K. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.

L. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

M. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

N. AWS D1.1/D1.1M - Structural Welding Code - Steel.

O. ICC A117.1 - Accessible and Usable Buildings and Facilities.

P. ITS (DIR) - Directory of Listed Products.

Q. NEMA MG 1 - Motors and Generators.

R. NFPA 13 - Standard for the Installation of Sprinkler Systems.

S. NFPA 70 - National Electrical Code.

T. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.

U. UL (DIR) - Online Certifications Directory.

1.04 DEFINITIONS

A. Defective Elevator Work: Repeated operation or control system failures; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate work with other installers to provide conduits necessary for installation of wiring including but not limited to:
      a. Elevator equipment devices remote from elevator machine room or hoistway.
      b. Telephone service for machine room.
      c. Elevator pit for lighting and sump pump.
      d. Fire alarm panel from controller cabinet.

B. Construction Use of Elevator: Not permitted.

1.06 PREINSTALLATION CONFERENCE

A. Preinstallation Conference: Convene a meeting one week prior to starting work.
   1. Review schedule of installation, installation procedures and conditions, and coordination with related work.

1.07 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit data on following items:
   1. Signal and operating fixtures, operating panels, and indicators.
   2. Car design, dimensions, layout, and components.
   3. Car and hoistway door and frame details.
   4. Electrical characteristics and connection requirements.

C. Shop Drawings: Submit drawings and details on following items:
   1. Show plans, elevations, sections, and large-scale details indicating service at each landing, machine room layout, coordination with building structure, relationships with other construction, and locations of equipment and signals. Indicate variations from specified requirements, maximum dynamic and static loads imposed on building structure at points of support.
   2. Elevator Equipment and Machines: Size and location of driving machines, power units, controllers, governors, and other components.
   3. Hoistway Components: Size and location of car guide rails, buffers, jack unit and other components.

4. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
5. Individual weight of principal components; load reaction at points of support.
6. Clearances and over-travel of car.
7. Locations in hoistway and machine room of traveling cables and connections for car lighting and telephone.
8. Location and sizes of hoistway and car doors and frames.
9. Calculated heat dissipation of elevator equipment in machine room.
10. Applicable seismic design data; certified by a licensed Professional Structural Engineer.
11. Interface with building security system.
12. Electrical characteristics and connection requirements and maximum and average power demands.
13. Indicate arrangement of elevator equipment and allow for clear passage of equipment through access openings.

D. Samples: Submit samples illustrating car interior finishes, car and hoistway door and frame finishes, handrail material and finish, and protective pads in the form of physical samples.

E. Manufacturer Confirmation: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service, as shown and specified, are adequate for elevator system being provided.

F. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

G. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

H. Initial Maintenance Contract.

I. Maintenance Contract: Submit proposal to Owner for standard one year continuing maintenance contract agreement in accordance with ASME A17.1 and requirements as indicated, starting on date initial maintenance contract is scheduled to expire.
1. Indicate in proposal the services, obligations, conditions, and terms for agreement period and for renewal options.

J. Operation and Maintenance Data:
1. Operation and maintenance manual.
2. Schematic drawings of equipment and hydraulic piping, and wiring diagrams of installed electrical equipment with list of corresponding symbols to identify markings on machine room and hoistway apparatus.

1.08 QUALITY ASSURANCE

A. Designer Qualifications: Perform design under direct supervision of a licensed Professional Structural Engineer experienced in design of this type of work and licensed in Oregon.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.
1. Regularly engages in manufacturing, installing and servicing elevators of the type specified.
2. Manufactures major elevator components in North America.

C. Installer Qualifications: Elevator manufacturer or an experienced installer approved by elevator manufacturer who has completed elevator installations similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

E. Products Requiring Fire Resistance Rating: Listed and classified by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.

F. Products Requiring Electrical Connection: Listed and classified by UL (DIR) or testing agency acceptable to authorities having jurisdiction as suitable for the purpose indicated in construction documents.

1.09 COORDINATION

A. Coordinate installation of sleeves, block outs, and items that are embedded in concrete or masonry for elevator equipment. Furnish templates and installation instructions and deliver to Project site in time for installation.

B. Coordinate locations and dimensions of other work relating to hydraulic elevators including pit ladders, sumps, and floor drains in pits; entrance subsills; and electrical service, electrical outlets, lights, and switches in pits and machine rooms.

1.10 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer's warranty for elevator operating equipment and devices for one year from Date of Substantial Completion agreeing to repair, restore or replace defective elevator work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hydraulic Elevators:
   1. ThyssenKrupp Elevator; Endura Below Ground: www.thyssenkruppelevator.com.

B. Substitutions: See Section 01 60 00 - Product Requirements.

C. Products other than Basis of Design are subject to compliance with specified requirements and prior approval of Architect. By using products other than Basis of Design, the Contractor accepts responsibility for costs associated with any necessary modifications to related work, including any design fees.

D. Source Limitations: Provide elevator and associated equipment and components produced by a single manufacturer and obtained from a single supplier.

2.02 HYDRAULIC ELEVATORS

A. Hydraulic Service Elevator, No. 1:
   1. Hydraulic Elevator Equipment:
      a. Below ground conventional hydraulic.
   2. Drive System:
      a. Standard drive system.
   3. Operation Control Type:
      a. Selective Collective Automatic Operation Control.
   4. Service Control Type: Provide standard service control for elevator, in addition to the following.
      a. Independent Service Control.
   5. Security Features:
      a. Card key access control.
   6. Interior Car Height: 107 inch.
   7. Electrical Power: 480 volts; alternating current (AC); three phase; 60 Hz.
   8. Rated Net Capacity: 5000 pounds.
   9. Rated Speed: 100 feet per minute.
   10. Hoistway Size: As indicated on drawings.
   11. Interior Car Platform Size: 68 inch wide by 101 inch deep.
   12. Elevator Pit Depth: As indicated on drawings.
   13. Overhead Clearance at Top Floor: As indicated on drawings.
   14. Travel Distance: As indicated on drawings.
   15. Number of Stops: 3.
   16. Number of Openings: 3 Front.

17. Hydraulic Equipment Location: As indicated on drawings

2.03 COMPONENTS

A. Elevator Equipment:
   1. Motors, Hydraulic Equipment, Controllers, Controls, Buttons, Wiring, Devices, and Indicators: Comply with NFPA 70. Refer to Division 26
   2. Guide Rails, Cables, Buffers, Attachment Brackets and Anchors: Design criteria for components includes safety factors in accordance with applicable requirements of Elevator Code, ASME A17.1.
   3. Buffers: Spring type.
   4. Lubrication Equipment:
      a. Provide grease fittings for periodic lubrication of bearings.
      b. Lubrication Points: Visible and easily accessible.

B. Electrical Equipment:
   1. Motors: NEMA MG 1.
   2. Boxes, Conduit, Wiring, and Devices: As required by NFPA 70. Refer to Division 26.
   3. Sump Pump in Pit: Refer to Division 22.
   4. Spare Conductors: Provide ten percent in extra conductors and two pairs of shielded audio cables in traveling cables.
   5. Include wiring and connections to elevator devices remote from hoistway and between elevator machine room. Provide additional components and wiring to suit machine room layout. Refer to Division 26.

2.04 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with ASME A17.1, applicable local codes, and authorities having jurisdiction (AHJ).

B. Accessibility Requirements: Comply with ADA Standards.
   1. Accessibility Requirements: In addition to local governing regulations, comply with ICC A117.1 as amended by Chapter 11 of the Oregon Structural Specialty Code (OSSC) and the Oregon Elevator Specialty Code.

C. Perform structural steel design, fabrication, and installation in accordance with AISC 360.

D. Comply with seismic design requirements in accordance with ASME A17.1, applicable local codes, and authorities having jurisdiction (AHJ).
   1. Comply with Elevator Safety Requirements for Seismic Risk Zone in accordance with ASME A17.1, ASCE 7 and other related requirements.
      a. Project Seismic Risk: As indicated on drawings.

E. Perform welding of steel in accordance with AWS D1.1/D1.1M.

F. Fabricate and install door and frame assemblies in accordance with NFPA 80 and in compliance with requirements of authorities having jurisdiction.

G. Perform electrical work in accordance with NFPA 70.

H. Comply with venting or pressurization of the hoistway design in accordance with HVAC system requirements and authorities having jurisdiction.

I. Comply with fire protection sprinkler system of the hoistway design in accordance with NFPA 13 requirements and authorities having jurisdiction. Refer to Division 21.

2.05 OPERATION CONTROLS

A. Elevator Controls: Provide landing operating panels and landing indicator panels.
   1. Landing Operating Panels: Metallic type, one for originating "Up" and one for originating "Down" calls, one button only at terminating landings; with illuminating indicators.
   2. Landing Indicator Panels: Illuminating.
   3. Provide units with flat faceplates for mounting flush with body of unit recessed in wall.
   4. Comply with ADA Standards for elevator controls.

B. Interconnect elevator control system with building security, fire alarm, card access, smoke alarm, and building management control systems.

C. Door Operation Controls:
   1. Program door control to open doors automatically when car arrives at floor landing.
   2. Render "Door Close" button inoperative when car is standing at dispatch landing with doors open.
   3. If doors are prevented from closing for approximately ten seconds because of an obstruction, automatically disconnect door reopening devices, close doors more slowly until obstruction is cleared. Sound buzzer.
   4. Door Safety Devices: Moveable, retractable safety edges, quiet in operation; equipped with photo-electric light rays.
      a. Nudging Feature: After car doors are prevented from closing for a predetermined adjustable time, through activating door reopening device, a loud buzzer shall sound. When the doors are released, the doors shall begin to close at reduced kinetic energy.

D. Provide "Firefighter's Emergency Operation" in accordance with ASME A17.1, applicable building codes, and authorities having jurisdiction (AHJ).
   1. Designated Landing: As selected by Architect.

2.06 OPERATION CONTROL TYPE

A. Selective Collective Automatic Operation Control: Applies to car in single elevator shaft.
   1. Refer to description provided in ASME A17.1.
   2. Automatic operation by means of one button in the car for each landing served and by "UP" and "DOWN" buttons at the landings.
   3. Stops are registered by momentary actuation of landing car buttons without consideration of the number of buttons actuated or the sequence buttons are actuated, but the stops are made in the order that landings are reached in each direction of travel.
   4. All "UP" landing calls are made when car is traveling in the up direction.
   5. All "DOWN" landing calls are made when car is traveling in the down direction.
   6. Uppermost and lowermost calls are answered as soon as they are reached without consideration of the car travel direction.

2.07 SERVICE CONTROL TYPE

A. Independent Service Control:
   1. Provide key operated "Independent Service" on car operating panel. Key activation will remove that car from normal operation and cancel pre-registered car calls.
   2. Car will respond to selected floor. Car will not respond to any calls from landing call buttons. Car will only respond to calls placed on the car operating panel. Doors will remain open at last landing requested. Doors will close with a constant pressure on "Door Close" button.
   3. Key activation to normal operation will return car to normal operation.

2.08 SECURITY FEATURES

A. Security Features: In addition to above operational features, provide the following security features, where indicated. Security features shall not affect emergency firefighters' service. The main landing will not be locked out from the car to allow access out of the building to the "Security level".
   1. Card Key: Car and hall push buttons are activated and deactivated by security card readers provided as Work of other Sections.
   2. Security Cameras: Provide wiring and CCTV provisions in traveling cables for future security cameras in elevator.

2.09 EMERGENCY POWER

A. Set-up elevator operation to run with building emergency power supply when the normal building power supply fails, and in compliance with ASME A17.1 requirements.

B. Building Emergency Power Supply: Supplied by backup generator; provide elevator system components as required for emergency power characteristics with phase rotation the same as for normal power.
   1. Provide transfer switches and auxiliary contacts.
   2. Install connections to power feeders.

C. Emergency Lighting: Comply with ASME A17.1 elevator lighting requirements.

D. After the transfer of emergency power and advancement of elevator to landing has completed one cycle, operate elevator in normal operation using the emergency power supply.

2.10 MATERIALS

A. Steel Cylinder Casing: ASTM A139/A139M, Grade A steel.

B. Rolled Steel Sections, Shapes, Rods: ASTM A36/A36M.

C. Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel), with matte finish.

D. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.

E. Stainless Steel Sheet: ASTM A666, Type 304; No. 4 Brushed finish.

F. Stainless Steel Bars, Shapes and Moldings: ASTM A276/A276M, Type 304.

G. Extruded Aluminum: ASTM B221 (ASTM B221M), natural anodized finish unless otherwise indicated.

H. Resilient Flooring: Sheet flooring, as specified in Section 09 65 00, Type SV-1.

2.11 CAR AND HOISTWAY ENTRANCES

A. Elevator, No. 1:
   1. Car and Hoistway Entrances:
      a. Hoistway Fire Rating: As indicated on drawings.
      b. Elevator Door Fire Rating: As indicated on drawings.
      c. Framed Opening Finish and Material: Brushed stainless steel.
      d. Car Door Material: Stainless steel, with rigid sandwich panel construction.
      e. Hoistway Door Material: Stainless steel, with rigid sandwich panel construction.
      f. Door Type: Double leaf.
      g. Door Operation: Side opening, two speed.
      h. Door Width: 54 inch.
      i. Door Height: 96 inch.
      j. Sills: Extruded aluminum.

B. Sills/Thresholds: Configure to align with frame return and coordinate with floor finish.

2.12 CAR EQUIPMENT AND MATERIALS

A. Elevator Car, No. 1:
   1. Car Operating Panel: Provide main; flush-mounted applied face plate, with illuminated call buttons corresponding to floors served with "Door Open/Door Close" buttons, "Door Open" button, "Door Close" button, and alarm button.
      a. Panel Material: Stainless steel; one per car.
      b. Car Floor Position Indicator: Above door with illuminating position indicators.
      c. Mark buttons and switches with manufacturer's standard identification for required use or function that complies with ASME A17.1.
      d. Mount controls at heights complying with ICC A117.1.
      e. Provide engraving for Elevator Number, Elevator Capacity and No Smoking text on car control stations.
      f. Emergency Communication System: Provide system that complies with ASME A17.1. On activation, system dials preprogrammed number of monitoring station and identifies elevator location to monitoring station. System provides two-way voice communication without using a handset and provides visible signals that indicate when system has been activated and when monitoring station has responded.

System is contained in flush-mounted cabinet, with identification, instructions for use, and battery backup power supply.
g. Locate alarm button where it is unlikely to be accidentally actuated; not more than 54 inch above car finished floor.
2. Ventilation: Single speed fan with grille in ceiling.
3. Flooring: Resilient sheet flooring.
4. Front Return Panel: Stainless steel.
5. Door Wall: Stainless steel.
6. Side Walls: Stainless steel.
7. Rear Wall: Stainless steel.
8. Hand Rail: Stainless steel, at all three sides. Provide open clearance space 1-1/2 inch (38 mm) wide to face of wall.
a. Stainless Steel Finish: No. 4 Brushed.
9. Bumper Rail: Stainless steel below each hand rail.
a. Flat Bar Stock.
b. Stainless Steel Finish: No. 4 Brushed.
10. Ceiling:
a. Canopy Ceiling: As selected from manufacturer's full range of available materials.
b. Lighting: 6-LED.
11. Provide emergency access panel for egress from car at ceiling.

B. Car Accessories:
1. Certificate Frame: Stainless steel frame glazed with acrylic plastic, and attached with tamper-proof screws.
2. Protective Pads: Canvas cover, padded with impact-resistant fill material, sewn with piping edges; fire resistant in compliance with ASME A17.1; brass grommets for supports, covering side and rear walls and front return, with cut-out for control panel; provide one set for each elevator.
a. Color: As selected by Architect.
b. Provide at least 4 inch clearance from bottom of pad to finished floor.
c. Pad Supports: Stainless steel studs, and mounted from top of wall panels.

2.13 MACHINE ROOM FITTINGS

A. Wiring Diagrams: Provide two sets of standard wiring diagrams. One set shall remain in the elevator machine room and one set shall remain with the building management, physical plant and/or Owner.

B. Test and Inspection Log Book: Place a 3-ring binder labeled "Test and Inspection Log Book" in elevator machine room.
1. Provide a mounted pocket for testing and inspection log sheets.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting this work.

B. Verify that hoistway, pit, and machine room are ready for work of this section.

C. Verify hoistway shaft and openings are of correct size and within tolerance.

D. Verify location and size of machine foundation and position of machine foundation bolts.

E. Verify that electrical power is available and of correct characteristics.

3.02 PREPARATION

A. Arrange for temporary electrical power for installation work and testing of elevator components. Comply with requirements of Section 01 50 00 - Temporary Facilities and Controls.

B. Maintain elevator pit excavation free of water.

3.03 INSTALLATION

A. Coordinate this work with installation of hoistway wall construction.

B. Install system components, and connect equipment to building utilities.

C. Install cylinders plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor.

D. Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.

E. Provide conduit, electrical boxes, wiring, and accessories. Refer to Division 26.

F. Install hydraulic piping between cylinder and pump unit. Install piping above the floor, where possible. Where not possible, install underground piping in Schedule 40 PVC pipe casing assembled with solvent-cement fittings.

G. Mount machines, motors, and pumps on vibration and acoustic isolators, on bed plate and concrete pad, designed to effectively prevent transmission of vibrations to structure and thereby eliminate sources of structure-borne noise from elevator system.
   1. Place on structural supports and bearing plates.
   2. Securely fasten to building supports.
   3. Prevent lateral displacement.

H. Accommodate equipment in space indicated.

I. Install hoistway, elevator equipment, and components in accordance with approved shop drawings.

J. Install guide rails to allow for thermal expansion and contraction movement of guide rails.

K. Accurately machine and align guide rails, forming smooth joints with machined splice plates.

L. Coordinate installation of hoistway wall construction.

M. Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with cars. Where possible, delay installation of sills and frames until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.

N. Install hoistway door sills, frames, and headers in hoistway walls; grout sills in place, set hoistway floor entrances in alignment with car openings, and align plumb with hoistway.

O. Fill hoistway door frames installed in concrete or masonry solid with grout.

P. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.

Q. Machine Room Components: Clean and degrease; prime one coat, finish with one coat of enamel.

R. Lubricate operating parts of systems as recommended by manufacturer.

S. Adjust equipment for smooth and quiet operation.

3.04 TOLERANCES

A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1 and ASME A17.2.

B. Car Movement on Aligned Guide Rails: Smooth movement, without any objectionable lateral or oscillating movement or vibration.

3.05 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Acceptance Testing: On completion of elevator installation and before permitting use (either temporary or permanent) of elevators, perform acceptance tests as required and recommended by ASME A17.1 and by governing regulations and agencies.

C. Testing and inspection by regulatory agencies will be performed at their discretion.
   1. Schedule tests with agencies and notify Owner and Architect.
   2. Obtain permits as required to perform tests.
   3. Document regulatory agency tests and inspections in accordance with requirements.
   4. Perform tests required by regulatory agencies.
   5. Furnish test and approval certificates issued by authorities having jurisdiction.

D. Perform testing and inspection in accordance with requirements.
   1. Perform tests as required by ASME A17.2.
   2. Provide at least two weeks written notice of date and time of tests and inspections.
   3. Supply instruments and execute specific tests.

3.06 ADJUSTING

A. Adjust for smooth acceleration and deceleration of car to minimize passenger discomfort.

B. Adjust with automatic floor leveling feature at each floor landing to reach 1/4 inch maximum from flush with sill.

C. Make necessary adjustments of operating devices and equipment to ensure elevator operates safely, accurately and smoothly.

3.07 CLEANING

A. Remove protective coverings from finished surfaces.

B. Clean surfaces and components in accordance with manufacturers written instructions.

3.08 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

B. See Section 01 79 00 - Demonstration and Training, for additional requirements.

C. Demonstrate proper operation of equipment to Owner's designated representative.

D. Demonstration: Instruct Owner's personnel in proper use, operations, and daily maintenance of elevators. Review emergency provisions, including emergency access and procedures to be followed at time of operational failure and other building emergencies. Train Owner's personnel in procedures to follow in identifying sources of operational failures or malfunctions. Confer with Owner on requirements for a complete elevator maintenance program.
   1. Make a final check of each elevator operation with Owner's personnel present and before date of Substantial Completion. Determine that operation systems and devices are functioning properly.

3.09 PROTECTION

A. Do not permit construction traffic within car after cleaning.

B. Protect installed products until Date of Substantial Completion.

C. Touch-up, repair, or replace damaged products and materials prior to Date of Substantial Completion.

3.10 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance service by skilled employees of the elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Provide parts and supplies as used in the manufacture and installation of original equipment.
   1. Perform maintenance, including emergency callback service, during normal working hours.
   2. Include 24-hour-per-day, 7-day-per-week emergency callback service.
      a. Response Time: One hour or less.

B. Continuing Maintenance Proposal: Provide a continuing maintenance proposal from Installer to Owner, in the form of a standard 5 year maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.
   1. Do not include cost of continuing maintenance proposal in elevator contract.

3.11 MAINTENANCE

A. Refer to Section 01 70 00 - Execution, for additional requirements relating to initial maintenance service.

B. Provide Initial Maintenance Contract of elevator system and components in accordance with ASME A17.1 and requirements as indicated for 12 months from Date of Substantial Completion.

C. Submit proposal for continuation of Maintenance Contract in accordance with ASME A17.1 and requirements as indicated for installed elevator equipment.

D. Perform maintenance contract services using competent and qualified personnel under the supervision and direct employ of the elevator manufacturer or original installer.

E. Maintenance contract services shall not be assigned or transferred to any agent or other entity without prior written consent of Owner.

F. Examine system components monthly. Clean, adjust and lubricate equipment.

G. Include systematic examination, adjustment, and lubrication of elevator equipment.

H. Maintain and repair or replace parts, whenever required, using parts produced by original equipment manufacturer.

I. Perform work without removing cars from use during peak traffic periods.

J. Provide emergency call back service at all hours throughout period of this maintenance contract.

K. Maintain an adequate stock of parts for replacement or emergency purposes, and have personnel available to ensure the fulfillment of this maintenance contract without unreasonable loss of time.

END OF SECTION

SECTION 21 00 00
FIRE SUPPRESSION BASIC REQUIREMENTS
(Issued by Addendum No. 1)

PART 1 - GENERAL

1.01 DESIGN-BUILD SUMMARY OF WORK

A. Work included in 21 00 00 applies to Division 21, Fire Suppression work to provide materials, labor, tools, permits and incidentals to make fire suppression systems ready for Owner's use for proposed project.

1.02 DESIGN-BUILD INSTRUCTIONS

A. This document is issued to give Bidders a basis for preparing a proposal to design and install a complete Fire Suppression system for this project.

B. Alternates to this Document may be offered as a separate proposal.

1.03 DESIGN-BUILD DESIGN APPROACH

A. Use this Specification as a guide for design/engineering requirements, workmanship and materials or construction. Utilize design-build concept throughout construction phase of project.

B. Investigate and be apprised of applicable codes, rules, and regulations as enforced by AHJ.

C. Visit the Site of the proposed construction. Verify and inspect the existing site to determine conditions that affect this work.

1.04 DESIGN-BUILD DESIGN CRITERIA/CALCULATIONS

A. Related Work Specified Elsewhere:

1. Contents of Section apply to Division 21, Fire Suppression Specifications.
2. Requirements of Section are a minimum for Division 21, Fire Suppression Sections, unless otherwise stated in each Section, in which case that Section's requirements take precedence.

B. Fire Suppression Design Criteria: Refer to individual Division 21, Fire Suppression Sections for fire suppression system design criteria.

C. Fire Suppression Equipment: Refer to individual Division 21, Fire Suppression Sections for fire suppression equipment requirements.

1.05 SECTION INCLUDES

A. Work included in 21 00 00, Fire Suppression Basic Requirements applies to Division 21, Fire Suppression work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of fire protection systems for proposed project.

B. Contract Documents include, but are not limited to, Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Drawings, Addenda, Owner/Architect Agreement, and Owner/Contractor Agreement. Confirm requirements before commencement of work.

C. Definitions:

1. Provide: To furnish and install, complete and ready for intended use.
2. Furnish: Supply and deliver to project site, ready for unpacking, assembly and installation.
3. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at project site as required to complete Item of work furnished.

4. Approved or Approved Equivalent: To possess the same performance qualities and characteristics and fulfill the utilitarian function without any decrease in quality, durability or longevity. For equipment/products defined by the Contractor as "equivalent," substitution requests must be submitted to Engineer for consideration, in accordance with Division 01, General Requirements, and approved by the Engineer prior to submitting bids for substituted Item.
5. Authority Having Jurisdiction (AHJ): Indicates reviewing authorities, including local fire marshal, Owner's insurance underwriter, Owner's representative, and other reviewing entity whose approval is required to obtain systems acceptance.

1.06 RELATED SECTIONS

A. Content of Section applies to Division 21, Fire Suppression Contract Documents.

B. Related Work:

1. Additional conditions apply to this Division including, but not limited to:
    a. Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.
    b. Drawings
    c. Addenda
    d. Owner/Architect Agreement
    e. Owner/Contractor Agreement
    f. Codes, Standards, Public Ordinances and Permits

1.07 REFERENCES AND STANDARDS

A. References and Standards per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, individual Division 21, Fire Suppression Sections and those listed in this Section.

B. Codes to include latest adopted editions, including current amendments, supplements and local jurisdiction requirements in effect as of the date of the Contract Documents, of/from:

1. State of Oregon:
    a. OAR - Oregon Administrative Rules
    b. OESC - Oregon Electrical Specialty Code
    c. OFC - Oregon Fire Code
    d. OMSC - Oregon Mechanical Specialty Code
    e. OPSC - Oregon Plumbing Specialty Code
    f. OSSC - Oregon Structural Specialty Code
    g. OEESC - Oregon Energy Efficiency Specialty Code
    h. Oregon Elevator Specialty Code

C. Reference standards and guidelines include but are not limited to the latest adopted editions from:

1. ABA - Architectural Barriers Act
2. ADA - Americans with Disabilities Act
3. AHRI - Air-Conditioning Heating & Refrigeration Institute
4. ANSI - American National Standards Institute
5. ASCE - American Society of Civil Engineers
6. ASCE-7 Minimum Design Loads for Buildings and Other Structures
7. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers
8. ASHRAE Guideline 0, the Commissioning Process

9. ASME - American Society of Mechanical Engineers
10. ASPE - American Society of Plumbing Engineers
11. ASSE - American Society of Sanitary Engineering
12. ASTM - ASTM International
13. AWWA - American Water Works Association
14. CFR - Code of Federal Regulations
15. EPA - Environmental Protection Agency
16. ETL - Electrical Testing Laboratories
17. FCC - Federal Communications Commission
18. FM - FM Global
19. FM Global - FM Global Approval Guide
20. IAPMO - International Association of Plumbing and Mechanical Official
21. ICC - International Code Council
22. IEC - International Electrotechnical Commission
23. ICC-ESR - International Code Council Evaluation Service Reports
24. HI - Hydraulic Institute Standards
25. ISO - International Organization for Standardization
26. MSS - Manufacturers Standardization Society
27. NEC - National Electric Code
28. NEMA - National Electrical Manufacturers Association
29. NFPA - National Fire Protection Association:
    a. NFPA 13 - Standard for the Installation of Sprinkler Systems
    b. NFPA 14 - Standard for the Installation of Standpipe and Hose Systems
    c. NFPA 24 - Standard for Installation of Private Fire Service Mains and Their Appurtenances
    d. NFPA 25 - Standard for Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems
    e. NFPA 70 - National Electrical Code
    f. NFPA 72 - National Fire Alarm and Signaling Code
30. NRCA - National Roofing Contractors Association
31. NSF - National Sanitation Foundation
32. OSHA - Occupational Safety and Health Administration
33. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association, Inc.
34. TIMA - Thermal Insulation Manufacturers Association
35. UL - Underwriters Laboratories Inc.

D. See Division 21, Fire Suppression individual Sections for additional references.

E. Where code requirements are at variance with Contract Documents, meet code requirements as a minimum requirement and include costs necessary to meet these in Contract. Machinery and equipment are to comply with OSHA requirements, as currently revised and interpreted for equipment manufacturer requirements. Install equipment provided per manufacturer recommendations.

F. Whenever this Specification calls for material, workmanship, arrangement or construction of higher quality and/or capacity than that required by governing codes, higher quality and/or capacity take precedence.

G. Piping Insulation products to contain less than 0.1 percent by weight PBDE in all insulating materials.

1.08 SUBMITTALS

A. See Division 01, General Requirements for Submittal Procedures as well as specific individual Division 21, Fire Suppression sections.

B. Provide drawings in format and software release equal to the design documents. Drawings to be the same sheet size and scale as the Contract Documents.

C. "No Exception Taken" constitutes that review is for general conformance with the design concept expressed in the Contract Documents for the limited purpose of checking for conformance with information given. Any action is subject to the requirements of the Contract Documents. Contractor is responsible for the dimensions and quantity and will confirm and correlate at the job site, fabrication processes and techniques of construction, coordination of the work with that of all other trades, and the satisfactory performance of the work.

D. Provide product submittals and shop drawings in electronic format only. Electronic format must be submitted via zip file via e-mail. For electronic format, provide one zip file per specification division containing a separate file for each Specification Section. Individual submittals sent piecemeal in a per Specification Section method will be returned without review or comment. Copy Architect on all transmissions/submissions.

E. Submit shop drawings, calculations and product data sheets as one complete stand-alone package to AHJ, Owner's insurance underwriter and Engineer.

F. Product Data: Provide Manufacturer's descriptive literature for products specified in Division 21, Fire Suppression Sections.

G. Identify/mark each submittal in detail. Note what differences, if any, exist between the submitted item and the specified item. Failure to identify the differences will be considered cause for disapproval. If differences are not identified and/or not discovered during the submittal review process, Contractor remains responsible for providing equipment and materials that meet the Specifications and Drawings.

1. Label submittal to match numbering/references as shown in Contract Documents. Highlight and label applicable information to individual equipment or cross out/remove extraneous data not applicable to submitted model. Clearly note options and accessories to be provided, including field installed Item. Highlight connections by/to other trades.
2. Include technical data, installation instructions and dimensioned drawings for products, equipment and devices installed, furnished or provided. Reference Division 21, Fire Suppression specification Sections for specific Item required in product data submittal outside of these requirements.
3. Provide pump curves, operation characteristics, capacities, ambient noise criteria, etc. for equipment.
4. For vibration isolation of equipment, list make and model selected with operating load and deflection. Indicate frame type where required. Submit manufacturer's product data.
5. See Division 21, Fire Suppression Sections for additional submittal requirements outside of these requirements.

H. Maximum of two reviews provided of complete submittal package. Arrange for additional reviews and/or early review of long-lead Item; Bear costs of additional reviews at Engineer's hourly rates. Incomplete submittal packages/submittals will be returned to contractor without review.

I. Resubmission Requirements: Make corrections or changes in submittals as required, and in consideration of Engineer’s comments. Identify Engineer’s comments and provide an individual response to each of the Engineer’s comments. Cloud changes in the submittals and further identify changes which are in response to Engineer’s comments.

J. Structural/Seismic: Provide weights, dimensions, mounting requirements and like information required for mounting, seismic bracing, and support. Indicate manufacturer's installation and support requirements to meet ASCE 7-10 requirements for non-structural components. Provide engineered seismic drawings and equipment seismic certification. Equipment Importance Factor as specified in Division 01 and in Structural documents.

K. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required per Division 21, Fire Suppression coordination documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 26, Electrical and Division 28, Electronic Safety and Security submittals.

L. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.

M. Substitutions and Variation from Basis of Design:

1. The Basis of Design designated product establishes the qualities and characteristics for the evaluation of any comparable products by other listed acceptable manufacturers if included in this Specification or included in an approved Substitution Request as judged by the Design Professional.
2. If substitutions and/or equivalent equipment/products are being proposed, it is the responsibility of parties concerned, involved in, and furnishing the substitute and/or equivalent equipment to verify and compare the characteristics and requirements of that furnished to that specified and/or shown. If greater capacity and/or more materials and/or more labor is required for the rough-in, circuitry or connections than for the item specified and provided for, then provide compensation for additional charges required for the proper rough-in, circuitry and connections for the equipment being furnished. No additional charges above the Base Bid, including resulting charges for work performed under other Divisions, will be allowed for such revisions. Coordinate with the requirements of "Submittals". For any product marked "or approved equivalent", a substitution request must be submitted to Engineer for approval prior to purchase, delivery or installation.

N. Shop Drawings:

1. Provide coordinated Shop Drawings which include physical characteristics of all systems, equipment and piping layout, pipe layout, hanger layout, sway brace layout, seismic restraints, sway brace calculations, drains, location of drain discharge, risers, valves, details, water test information, physical device layout plans, and control wiring diagrams. Reference individual Division 21, Fire Suppression Sections for additional requirements for shop drawings outside of these requirements.
2. Shop Drawings and hydraulics calculations, sway brace calculations, trapeze hanger calculations, and the like, to be prepared under the direct supervision and control of a Professional Engineer competent to do such work and licensed in the state of Oregon. Drawings and calculations to bear the seal and wet signature of the professional Engineer.
3. Provide Shop Drawings which indicate information required by NFPA 13 and 24. Include room names and fire sprinkler occupancy hazard classifications.
4. Provide Shop Drawings illustrating information for Hydraulic Information Sign for each hydraulic remote area calculated.
5. Utilizing the Reflected Ceiling backgrounds, provide Shop Drawings illustrating locations of fire sprinklers and piping.
6. Utilizing the Structural backgrounds, provide Shop Drawings illustrating locations and types of hangers and sway braces.
7. Provide Shop Drawings illustrating each type of hanger, including fasteners to structure.

8. Provide Shop Drawings illustrating each type of branchline restraint and sway brace, including length of sway brace member, sway brace fittings, minimum and maximum angles from vertical of sway brace member, method of attachment to structure, size, length and embedment of attachment to structure and size and type of structural member to which sway brace will be attached. Number each type of restraint and sway brace. Indicate on Drawings locations of each type of numbered restraint and sway brace.
9. Provide details for any hanger, attachment, or sway brace to be attached to any I-joist, structural insulated panels (SIPs), cross laminated timber, and similar engineered structural products according to the specifications of the engineered product manufacturer.
10. Provide Shop Drawings illustrating information for Sprinkler System General Information Sign.
11. Shop Drawings to include a cross-sectional view that shows the sprinkler heads and piping in relation to the building's architectural and structural information. View to be chosen based on a location that will display the most information.
12. When required, provide Coordination Drawings.
13. Provide Shop Drawings indicating access panel locations, size and elevation for approval prior to installation.
14. Provide details of hanger, sway bracing and branch line restraint attachments to structure and to piping. Include details on the size and load capacities of fasteners. Provide verification of the structural capacity to withstand seismic load.
15. Provide sway bracing calculations on drawings showing horizontal seismic design load and requirements, with indication of zone of influence for each bracing location.
16. Provide a schedule of sway bracing type, size, and design criteria, including length, angle from vertical, and load capacities.
17. Clearly indicate the elevation of the highest sprinkler in relation to the elevation of the flow test pressure gauge monitor hydrant.
18. Provide details of flexible sprinkler hose fitting per manufacturer's schedule of equivalent feet used in hydraulic calculations, showing device length, maximum number of 90-degree bends and expected radius of bends.
19. Provide a schedule of signage to be installed at each flexible sprinkler hose fitting.
20. On the drawings, provide a list of number, model, temperature, sprinkler Identification number, manufacturer, orifice, deflector type, thermal sensitivity and pressure rating, quantity of each type to be contained in the spare sprinkler cabinet and the issue date or revision date of the list."
21. Spare sprinkler head cabinet size indicating the number of spare sprinkler head to be contained therein.

O. Samples: Provide samples when requested by individual Sections.

P. Resubmission Requirements:

1. Make any corrections or change in submittals when required. Provide submittals as specified. The Engineer will not be required to edit and/or interpret the Contractor's submittals. Indicate changes for the resubmittal in a cover letter with reference to page(s) changed and reference response to comment. Clearly indicate changes on Drawings and cloud changes in the submittals.
2. Resubmit for review until review indicates no exceptions taken or make "corrections as noted".

Q. Operation and Maintenance Manuals/Owners Instructions:

1. Submit, at one time, electronic files (PDF format) on CD/DVD of manufacturer's operation and maintenance instruction manuals and parts lists for equipment or Item requiring servicing. Include valve charts. Submit data when work is substantially complete and in same order format as submittals. Include name and location of source parts and service for each piece of equipment.
    a. Include copies of certificates of code authority acceptance, code-required acceptance tests; test reports and certificates.
    b. Include Warranty per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Sections.
    c. Catalog description of each Item of equipment actually installed on job.
    d. Instructions for operation and maintenance of fire suppression systems composed of operating instructions, maintenance instructions and manufacturer's literature as follows:
        1) Testing and Maintenance Schedule Chart: Provide an 8-1/2- by 11-inch typewritten list of each item of installed equipment requiring testing inspection , lubrication or service, describing and scheduling performance of maintenance.
        2) Manufacturer's Literature: Provide copies of manufacturer's instructions for operation and maintenance of fire suppression equipment, including replacement parts list with name and address of nearest distributor. Mark each copy with equipment identification label as listed in equipment schedule, i.e. F-5 etc.
    e. Include product certificates of warranties and guarantees.
    f. Include Record Drawings,
    g. Include copy of water supply flow test used as basis for hydraulic calculations.
    h. Include hydraulic calculations and sway brace calculations.
    i. Include Contractor’s Material and Test Certificates for Aboveground Piping/Underground Piping for Fire Sprinkler Systems.
    j. Include Contractor's Material and Test Certificates for Standpipe System NFPA 14.
    k. Include a copy of NFPA 25.
    l. Include a copy of valve charts and whether normally open or normally closed.
    m. Include a copy of drain, auxiliary, and low point drains charts.
    n. Include a copy of the list to be included in the spare sprinkler head box.
    o. Include copy of approved submittal data along with submittal review letters received from Engineer. Data to clearly indicate installed equipment model numbers. Delete or cross out data pertaining to other equipment not specific to this project.
    p. Include copy of manufacturer's standard Operations and Maintenance for equipment. At front of each tab, provide routine maintenance documentation for scheduled equipment. Include manufacturer's recommended maintenance schedule and highlight maintenance required to maintain warranty. Furnish list of routine maintenance parts, including part numbers, sizes, and quantities relevant to each piece of equipment: i.e. belts, motors, lubricants, and filters.
    q. Include copy of complete parts list for equipment. Include available exploded views of assemblies and sub-assemblies.
    r. Include copy of startup and test reports specific to each piece of equipment.

s. Engineer will return incomplete documentation without review. Engineer will provide one set of review comments in Submittal Review format. Contractor must arrange for additional reviews; Contractor to bear costs for additional reviews at Engineer's hourly rates.

2. Thoroughly instruct Owner in proper operation of equipment and systems. Where noted in individual Sections, training will include classroom instruction with applicable training aids and systems demonstrations. Field instruction per Section 21 00 00, Fire Suppression Basic Requirements, Article titled "Demonstration".

3. Copies of certificates of code authority inspections, acceptance, code required acceptance tests, letter of conformance and other special guarantees, certificates of warranties, specified elsewhere or indicated on Drawings.

R. Record Drawings:

1. Maintain at site at least one set of Drawings for recording “As-constructed” conditions. Indicate on Drawings changes to original documents by referencing revision document, and include buried elements, location of cleanouts, and location of concealed mechanical Item. Include items changed by field orders, supplemental instructions, and constructed conditions.

2. Record Drawings are to include equipment and fixture/connection schedules that accurately reflect "as constructed or installed" for project.

3. At completion of project, input changes to original project on CAD Drawings and make one set of black-line drawings created from CAD Files in version/release equal to contract drawings. Submit CAD disk and drawings upon substantial completion.

4. Invert elevations and dimensioned locations for water services and drainage piping below grade extending to 5-feet outside building line.

5. Record Drawings to include site information or reference site information for complete understanding of the fire protection system between the building and the point of connection to the water supply and location of flow test pressure hydrants.

6. See Division 21, Fire Suppression individual Sections for additional items to include in Record Drawings.

S. Calculations: Submit hydraulic and sway brace and the like calculations.

1. Hydraulic Calculations:

a. Include friction losses between the hydraulically most remote design area and the hydrant flow test pressure hydrant.

b. Hydraulic calculations to be performed on a nationally recognized fire sprinkler hydraulic calculation computer program, with cover sheets in the format required by the latest edition of NFPA 13. Hydraulic calculations performed “by hand” or not on a nationally recognized fire sprinkler hydraulic calculations computer program will be returned without review by engineer.

c. Provide one or more hydraulic calculations for each hydraulically most remote area.

d. Where it is not obvious which area is most hydraulically remote, perform and submit for review additional hydraulic calculations proving the hydraulically most remote area.

e. For grid systems, either provide “peaked” hydraulic calculations, or provide two additional sets of hydraulic calculations for each hydraulically most remote area.

f. Include pressure losses between the highest sprinkler and the elevation of the pressure gauge monitor hydrant of the flow test.

g. Include friction loss for flexible branch line connectors per manufacturer's schedule of equivalent feet for device length, maximum number of bends and expected radius of bends.

h. For Class I manual standpipe system, provide hydraulic calculations per NFPA 14 providing required pressure at the topmost outlet with the calculations terminating at the fire department connection. Coordinate with responding fire department to determine responder's available pressure.

2. Sway Brace Calculations:

a. Sway brace calculations utilizing a proprietary computer calculation program only used for the sway brace components supported by that manufacturer. For example, only "manufacturer X" sway brace components, and not those of another manufacturer, may be calculated on a "manufacturer X" sway brace computer calculation program.

b. Provide seismic calculations for any sway brace to be attached to any I-joist, structural insulated panels (SIPs), cross laminated timber, and similar engineered structural products according to the specifications of the I-joist manufacturer.

1.09 QUALITY ASSURANCE

A. Regulatory Requirements: Work and materials installed to conform with all local, State, Federal and other applicable laws and regulations.

B. Drawings are intended to be diagrammatic and reflect the Basis of Design manufacturer's equipment. They are not intended to show every Item in its exact dimensions, or details of equipment or proposed systems layout. Verify actual dimensions of systems (i.e., piping) and equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than Basis of Design, including, but not limited to, architectural, structural, electrical, HVAC, fire sprinkler, and plumbing systems.

C. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect, in writing, before starting work.

D. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.

E. Provide products that are UL listed.

1.10 WARRANTY

A. Provide written warranty covering the work for a period of one year from date of Substantial Completion in accordance with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.

B. Sections under this Division can require additional and/or extended warranties that apply beyond basic warranty under Division 01, General Requirements and the General Conditions. Confirm requirements in all Contract Documents.

1.11 COORDINATION DOCUMENTS

A. Prior to construction, coordinate installation and location of HVAC equipment, ductwork, grilles, diffusers, piping, plumbing equipment/fixtures, fire sprinklers, fire alarm, plumbing, cable trays, lights, and electrical services with architectural and structural requirements, and other trades (including fire alarm ceiling suspension and tile systems), and provide maintenance access requirements. Coordinate with submitted architectural systems (i.e. roofing, ceiling, and finishes) and structural systems as submitted, including footings and foundation. Identify zone of influence from footings and ensure systems are not routed within the zone of influence.

B. Advise Architect in the event a conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.

C. Verify in field exact size, location, invert, and clearances regarding existing material, equipment and apparatus, and advise Architect of discrepancies between that indicated on Drawings and that existing in field prior to installation.

D. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Provide like Item from one manufacturer, including but not limited to sprinkler heads, pipe, fittings, hangers and bracing materials.

2.02 MATERIALS

A. Base contract upon furnishing materials as specified. Materials, equipment, and fixtures used for construction are to be new, latest products as listed in manufacturer's printed catalog data and are to be UL, ETL, FM, and ICC-ES approved for their intended fire protection function or have adequate approval or be acceptable by State, County, and City authorities.

B. Articles, fixtures and equipment of a kind to be standard product of one manufacturer.

C. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.

D. Hazardous Materials:

1. Comply with local, State of Oregon, and Federal regulations relating to hazardous materials.
2. Comply with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements for this project relating to hazardous materials.
3. Do not use any materials containing a hazardous substance. If hazardous materials are encountered, do not disturb; immediately notify Owner and Architect. Hazardous materials will be removed by Owner under separate contract.

PART 3 - EXECUTION

3.01 ACCESSIBILITY AND INSTALLATION

A. Confirm Accessibility and Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.

B. Install equipment requiring access (i.e. drains, control operators, valves, motors, engines, pumps, controllers, air compressors, gauges, fill cups, tanks, cleanouts and the like) so that they may be serviced, reset, replaced or recalibrated by service people with normal service tools and equipment. Do not install equipment in obvious passageways, doorways, scuttles or crawlspaces which would impede or block intended usage.

C. Install equipment and products complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of equipment and examine instructions thoroughly. When requirements of installation instructions conflict with Contract Documents, request clarification from Architect prior to proceeding with installation. This includes proper installation methods, sequencing, and coordination with other trades and disciplines.

D. Earthwork:

1. Confirm Earthwork requirements in Contract Documents. In absence of specific requirements, comply with the following:
   a. Perform excavation, dewatering, shoring, bedding, and backfill required for installation of work in this Division in accordance with the provisions specified. Contact utilities and locate existing utilities prior to excavation. Repair any work damaged during excavation or backfilling.
   b. Excavation: Do not excavate under footings, foundation bases, or retaining walls.

c. Provide protection of underground systems. Review the project Geotechnical Report for references to corrosive or deleterious soils which will reduce the performance or service life of underground systems materials.

E. Firestopping:

1. Confirm Firestopping requirements in Division 07, Thermal and Moisture Protection. In absence of specific requirements, comply with individual Division 21, Fire Suppression Sections and the following:

a. Coordinate location and protection level of fire and/or smoke rated walls, ceilings, and floors. When these assemblies are penetrated, seal around piping, ductwork and equipment with approved firestopping material. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM International E814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops.

F. Pipe Installation:

1. Provide installation of piping systems coordinated to account for expansion and contraction of piping materials and building as well as anticipated settlement or shrinkage of building. Install work to prevent damage to piping, equipment, and building and its contents. Provide piping offsets, loops, expansion joints, sleeves, anchors or other means to control pipe movement and minimize forces on piping. Verify anticipated settlement and/or shrinkage of building with Project Structural Engineer. Verify construction phasing, type of building construction products and rating coordinating installation of piping systems.

2. Include provisions for servicing and removal of equipment without dismantling piping.

G. Plenums: Provide plenum rated materials that meet the requirements to be installed in plenums. Immediately notify Architect/Engineer of discrepancy.

3.02 SEISMIC CONTROL

A. Confirm Seismic Control requirements in Division 01, General Requirements, Structural documents, and individual Division 21, Fire Suppression Sections.

B. General:

1. Provide fire suppression equipment and piping, both hanging and base mounted, with mounting connection points of sufficient strength to resist lateral seismic forces equal to lateral seismic forces as determined by building code and NFPA 13 calculations, whichever is more demanding.

2. See Structural Drawings for seismic design criteria for sway bracing and seismic restraint.

3. Earthquake resistant designs for Fire Protection (Division 21) equipment and distribution, i.e. fire sprinkler systems, fire standpipe systems, fire pumps, fire pump controllers, fire tanks, clean agent fire suppression systems, etc. to conform to regulations of jurisdiction having authority.

4. Restraints which are used to prevent disruption of function of piece of equipment because of application of horizontal force to be such that forces are carried to frame of structure in such a way that frame will not be deflected when apparatus is attached to a mounting base and equipment pad, or to structure in normal way, utilizing attachments provided. Secure equipment and distribution systems to withstand a force in direction equal to value defined by jurisdiction having authority.

5. Provide stamped Shop Drawings from licensed Structural Engineer of seismic bracing and seismic movement assemblies for piping, equipment, tanks, pumps controllers and the like. Submit shop drawings along with equipment submittals.

6. Provide stamped Shop Drawings from licensed Structural Engineer of seismic flexible joints for piping and crossing building expansion or seismic joints. Submit Shop Drawings along with seismic bracing details.

7. Provide details of flexible drops for sprinklers in conformance with Building Code and ASCE 7 requirements of ceilings. Coordinate with Architectural and Structural Drawings and Specifications.

C. Piping: Per NFPA 13, ASCE-7 and local requirements.

D. Equipment:

1. Per "Seismic Restraints Manual Guidelines for Mechanical Systems" latest edition published by SMACNA, ASCE 7 and local requirements.
2. Provide means to prohibit excessive motion of fire protection equipment during an earthquake.

3.03 REVIEW AND OBSERVATION

A. Confirm Review and Observation requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.

B. Notify Architect, in writing, at following stages of construction so that they may, at their option, visit site for review and construction observation:

1. Underground piping installation prior to backfilling.
2. Prior to covering walls.
3. Prior to ceiling cover/installation.
4. When main systems, or portions of, are being tested and ready for inspection by AHJ.
5. When mains or branchlines are to be permanently concealed by construction or insulation systems.
6. When fire suppression systems, or portions of, are being tested and ready for inspection by AHJ.

C. Bear responsibility and cost to make piping accessible, to expose concealed lines, or to demonstrate acceptability of the system. If Contractor fails to notify Architect at times prescribed above, costs incurred by removal of such work are the responsibility of the Contractor.

D. Final Punch: Costs incurred by additional trips required due to incomplete systems will be the responsibility of the Contractor.

3.04 CUTTING AND PATCHING

A. Confirm Cutting and Patching requirements in Division 01, General Requirements. In absence of specific requirements, comply with individual Division 21, Fire Suppression Sections and the following:

1. Cutting and patching performed under Division 21, Fire Suppression includes, but is not limited to:
   a. Cutting and patching of plaster or partitions.
   b. Cutting and patching of finished ceilings.
2. Perform cutting and patching by skilled craftsmen in trade of work to be performed. Fill holes which are cut oversized for completed work. Match refinished areas with existing adjacent finish in a manner acceptable to Architect.
3. When masonry to concrete construction must be penetrated, provide a steel pipe sleeve in opening and grout in place in a neat manner. Leave grout surface to match existing finish. Provide escutcheons. If sleeves are not provided, core drill penetrations.
4. Locate concealed utilities to eliminate possible service interruption or damage.
5. Additional work required by lack of proper coordination will be provided at no additional cost to the Owner.

6. Proposed floor cutting/core drilling/sleeve locations to be approved by Project Structural Engineer. Submit proposed locations to Architect/Project Structural Engineer. Where slabs are of post tension construction, perform x-ray scan of proposed penetration locations and submit scan results including proposed penetration locations to Project Structural Engineer/Architect for approval. Where slabs are of waffle type construction, show column cap extent and cell locations relative to proposed penetration(s).
7. Cutting, patching and repairing for work specified in this Division including plastering, masonry work, concrete work, carpentry work, and painting included under this Section will be performed by skilled craftsmen of each respective trade in conformance with appropriate Division of Work.
8. Additional openings required in building construction to be made by drilling or cutting. Use of jack hammer is specifically prohibited. Patch openings in and through concrete and masonry with grout.
9. Restore new or existing work that is cut and/or damaged to original condition. Patch and repair specifically where existing items have been removed. This includes repairing and painting walls, ceilings, etc. where existing conduit and devices are removed as part of this project. Where alterations disturb lawns, landscaping, paving, and walks, surfaces to be repaired, refinished and left in condition matching existing prior to commencement of work.
10. Repair mutilation of building around pipes, equipment, hangers, and braces.

3.05 EQUIPMENT SELECTION AND SERVICEABILITY

A. Replace or reposition equipment which is too large or located incorrectly to permit servicing at no additional cost to Owner.

3.06 DELIVERY, STORAGE AND HANDLING

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Division 21, Fire Suppression Sections and the following:
   1. Handle materials delivered to project site with care to avoid damage and deterioration. Store materials in original containers which identify manufacturer, name, brand and model numbers on site inside building or protected from weather, sun, dirt and construction dust. Insulation and lining that becomes wet from improper storage and handling to be replaced before installation. Products and/or materials that become damaged due to water, dirt and/or dust as a result of improper storage to be replaced before installation.
   2. Protect equipment and pipe to avoid damage. Close pipe openings with caps or plugs. Keep motors and bearings in watertight and dustproof covers during entire course of installation.
   3. Protect bright finished shafts, bearing housings and similar Item until in service.

3.07 DEMONSTRATION

A. Confirm Demonstration requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.

B. Upon completion of work and adjustment of equipment and test systems, demonstrate to Owner's Representative, Architect and Engineer that equipment furnished and installed or connected under provisions of these Specifications functions in manner required. Provide field instruction to Owner's Maintenance Staff as specified in Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.

C. Manufacturer's Field Services: Furnish services of a qualified person at time approved by Owner to instruct maintenance personnel, correct defects or deficiencies, and demonstrate to satisfaction of Owner that entire system is operating in satisfactory manner and complies with requirements of other trades that may be required to complete work. Complete instruction and demonstration prior to final job site observations.

D. Prior to acceptance of work and during time designated by Architect, provide necessary qualified personnel to operate system for a period of two hours.

E. Instruct the Owner in the operation of the sprinkler system, including main valve position (open or closed) recognition, system drainage, system testing, dry pipe valve reset and the relation to the fire alarm system.

F. Upon completion of work and adjustment of equipment, test systems to demonstrate to Owner's Representative and Architect that equipment is furnished and installed or connected under provisions of these Specifications.

3.08 CLEANING

A. Confirm Cleaning requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.

B. Upon completion of installation, except for sprinklers, thoroughly clean exposed portions of equipment, removing temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated during work.

C. Sprinklers may not be cleaned except for vacuuming in a manner in which no part of the sprinkler is touched by the vacuuming equipment. Replace sprinklers which bear traces of foreign substances with sprinklers of same model, temperature, K-factor, orifice, finish, style, orientation, and the like.

3.09 INSTALLATION

A. Confirm Installation requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.

B. Install equipment in accordance with manufacturer's installation instructions, plumb and level and firmly anchored to vibration isolators. Maintain manufacturer's recommended clearances.

C. Start-up equipment, in accordance with manufacturer's start-up instructions, in the presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment. Provide pump impellers to obtain Basis of Design design capacities.

D. Provide miscellaneous supports/metals required for installation of equipment and piping.

3.10 PAINTING

A. Confirm requirements in Division 01, General Requirements and Division 09, Finishes. In absence of specific requirements, comply with individual Division 21, Fire Suppression Sections and the following:

1. Ferrous Metal: After completion of fire protection work, thoroughly clean and paint exposed supports constructed of ferrous metal surfaces, i.e., hangers, hanger rods, equipment stands, with one coat of black asphalt varnish for exterior or black enamel for interior, suitable for hot surfaces.

2. After acceptance by Authority Having Jurisdiction (AHJ), in a mechanical room, on roof or other exposed areas, machinery and equipment not painted with enamel to receive two coats of primer and one coat of rustproof enamel, colors as selected by Architect.

3. Structural Steel: Repair damage to structural steel finishes or finishes of other materials damaged by cutting, welding or patching to match original.

4. Piping: Clean, primer coat and paint exposed piping on roof or at other exterior locations with two coats paint suitable for metallic surfaces and exterior exposures. Color selected by Architect.
5. Covers: Covers such as vault covers and the like will be furnished with finishes which resist corrosion and rust.

3.11 ACCEPTANCE

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Sections in Division 21, Fire Suppression and the following:

1. System cannot be considered for acceptance until work is completed and demonstrated to Architect that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
    a. Testing reports including Contractor's Material and Test Certificate for Underground Piping, Contractor's Material and Test Certificate for Aboveground Piping, Contractor's Material and Test Certificate for Private Fire Service Mains, Fire pump acceptance test data report, and the like.
    b. Cleaning
    c. Operation and Maintenance Manuals
    d. Training of Operating Personnel
    e. Record Drawings
    f. Warranty and Guaranty Certificates
    g. Start-up/Test Document and Commissioning Reports
    h. Letter of Conformance

3.12 FIELD QUALITY CONTROL

A. Confirm Field Quality Control requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 21 00 00, Fire Suppression Basic Requirements and individual Division 21, Fire Suppression Sections.

B. Upon completion of installation of equipment, sprinklers, hose valves and piping and after units are water pressurized, test system to demonstrate capability and compliance with requirements. When possible, correct malfunctioning Item at site, then retest to demonstrate compliance; otherwise remove and replace with new Item and proceed with retesting.

C. Inspect each installed Item for damage to finish. If feasible, restore and match finish to original, except fire sprinklers, at site; otherwise, remove Item and replace with new Item. Feasibility and match to be judged by Architect. Remove cracked or dented Item and replace with new Item.

D. Fire sprinklers may not be reused, or cleaned, except for dusting. Replace damaged, field painted, oversprayed, overcoated or field coated sprinklers with new sprinklers of same manufacturer, model, finish, K-factor and performance characteristics. Where identical replacement sprinklers are not available, provide sprinklers of similar finish, style, K-factor and performance characteristics.

3.13 LETTER OF CONFORMANCE

A. Provide Letter of Conformance and copies of manufacturers' warranties and extended warranties with a statement that fire suppression items were installed in accordance with manufacturer's recommendations, UL listings and FM Global approvals. Include Letter of Conformance, copies of manufacturers' warranties and extended warranties in Operation and Maintenance Manuals.

3.14 ELECTRICAL INTERLOCKS

A. Where equipment motors are to be electrically interlocked with other equipment for simultaneous operation, utilize fire protection equipment wiring diagrams to coordinate with electrical systems so that proper wiring of equipment involved is affected.

3.15 CONNECTIONS TO EXISTING

A. Prior to connection of piping to existing piping or utilities, field verify existing conditions and exact sizes and locations of existing piping. Provide additional offsets, transitions, joints, cut-ins, and replace portions of existing as required to facilitate connections of new.

END OF SECTION

SECTION 21 05 00
COMMON WORK RESULTS FOR FIRE SUPPRESSION
(Issued by Addendum No. 1)

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Buried Ductile Iron Pipe and Fittings
   2. Buried PVC (Polyvinyl Chloride) Pipe and Fittings
   3. Joint Restraints
   4. Aboveground Black Steel Pipe and Fittings
   5. Wall and Floor Penetrations and Sleeves
   6. Switches, Valve Supervisory
   7. Switches, Water Detector
   8. Hangers and Supports
   9. Struts and Strut Clamps
   10. Sway Braces and Restraints
   11. Anchors and Attachments
   12. Pipe Stands
   13. Gauges
   14. Bells
   15. Fire Department Connection
   16. Valves
   17. Post Indicator Valve Assemblies
   18. Backflow Prevention Devices
   19. Pipe, Valve, and Fire Protection Equipment Identification
   20. Signs
   21. Drains

1.02 RELATED SECTIONS

A. Contents of Division 21, Fire Suppression and Division 01, General Requirements apply to this Section.

B. In addition, reference the following:
   1. Division 22, Plumbing
   2. Division 23, Heating, Ventilating and Air Conditioning
   3. Division 26, Electrical
   4. Division 28, Electronic Safety and Security
   5. Division 31, Earthwork
   6. Section 21 00 00, Fire Suppression Basic Requirements

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 21 00 00, Fire Suppression Basic Requirements and Division 01, General Requirements.

B. Meet requirements of ASCE 7, Minimum Design Loads for Buildings and Other Structures, by American Society of Civil Engineers, latest adopted edition.

1.04 SUBMITTALS

A. Submittals as required by Section 21 00 00, Fire Suppression Basic Requirements and Division 01, General Requirements.

B. Provide seismic calculations for any sway brace to be attached to any I-joist according to the specifications of the I-joist manufacturer.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 21 00 00, Fire Suppression Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:

1. Material and Equipment: Listed for its intended fire protection use in current UL Fire Protection Equipment Directory, or UL Online Certifications Directory for Fire Protection, International Code Council Evaluation Service Reports or FM Global Approval Guide, new and of current manufacture.
2. Provide per AHJ requirements.
3. References to product Specifications for materials are listed according to accepted ANSI, ASTM, ASME, AWWA and other base standards. Materials to meet latest approved versions of these standards.
4. See Section 21 00 00, Fire Suppression Basic Requirements where piping materials are approved for use.
5. Fire Suppression Screw-Thread Connections: Comply with local fire department/fire marshal regulations for sizes, threading and arrangement of connections for fire department equipment to fire department connections.
6. Manufacturers: Unless an item is marked "No substitutions", submit substitution request for materials of other than named manufacturers.
7. Noise and Vibration:
    a. Install vibration isolators and measures required to prevent noise and vibration from being transmitted to occupied areas. Select equipment to operate within noise coefficient (NC) design level for particular type of installation in relation to its location.
    b. After installation, make proper adjustments to reduce noise and vibration to acceptable levels as defined by Architect.
    c. In acoustically sensitive areas, design system in a manner that minimizes the number of wall penetrations.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 21 00 00, Fire Suppression Basic Requirements and Division 01, General Requirements.

1.07 FLOW TEST

A. Provide materials and labor for a new water supply test on the closest nearby fire hydrants per NFPA 13 and NFPA 291. Base hydraulic calculations on new flow test.

1.08 SYSTEM IMPAIRMENT

A. When returning a water-based fire protection system to service after impairment or control valve closure, verify the system is in working order by performing a main drain test per NFPA 25.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Buried Ductile Iron Pipe and Fittings:
   1. American Cast Iron Pipe Company
   2. Atlantic States Cast Iron Pipe Company
   3. Clow Water Systems Company
   4. Griffin Pipe Products Company
   5. McWane Cast Iron Pipe Company
   6. Pacific States Cast Iron Pipe Company
   7. United States Pipe & Foundry Company
   8. Star Pipe Products
   9. Tyler Union
   10. Or approved equivalent.

B. Buried PVC (Polyvinyl Chloride Pipe and Fittings:
   1. Certainteed Corporation
   2. JM Eagle
   3. National Pipe and Plastics Incorporated
   4. Or approved equivalent.

C. Joint Restraints:
   1. Star Pipe Products
   2. Tyler Pipe Company
   3. EBAA Iron, Incorporated
   4. Uni-Flange Corporation
   5. Union Foundry Company
   6. United States Pipe and Foundry Company
   7. Or approved equivalent.

D. Aboveground Black Steel Pipe and Fittings:
   1. Pipe:
      a. Bull Moose Tube
      b. Wheatland Tube Company
      c. Youngstown Tube Company
      d. Tex-Tube Company
      e. State Pipe and Supply, Incorporated
      f. Or approved equivalent
   2. Fittings, Mechanical and Grooved Couplings:
      a. Victaulic
      b. Gruvlok
      c. Shurjoint Piping Products Incorporated
      d. Smith-Cooper International
      e. Tyco Fire & Building Products
      f. Viking Corporation
      g. Allied Rubber and Gasket Company Incorporated, dba ARGCO

h. Anvil International
i. Dixon Valve & Coupling
j. Or approved equivalent.

3. Fittings, Threaded:
   a. Ward Manufacturing
   b. Anvil International
   c. Smith-Cooper International
   d. Aegis Technologies
   e. Or approved equivalent.
4. Fittings, Rubber Gasketed:
   a. Victaulic
   b. Anvil International
   c. AnvilStar
   d. EBAA Iron, Incorporated
   e. Shurjoint Piping Products, Incorporated
   f. Smith-Cooper International
   g. Tyco Fire & Building Products
   h. Viking Corporation
   i. Ward Manufacturing
   j. Allied Rubber and Gasket Company Incorporated, dba ARGCO
   k. Dixon Valve & Coupling
   l. Or approved equivalent.
5. Fittings, Welded:
   a. Anvil International
   b. Shurjoint Piping Products Incorporated
   c. Smith-Cooper International
   d. State Pipe & Supply, Incorporated
   e. Or approved equivalent.
6. Fittings, Flanged:
   a. Victaulic; Groove/Flange Adapter.
   b. United Brand Fittings
   c. U.S. Pipe
   d. Anvil S.P.F.
   e. Iowa Fittings Company
   f. Tyco Fire Products; Grinnell Groove/Flange Adapter
   g. Or approved equivalent.

E. Wall and Floor Penetrations and Sleeves:
   1. Allied Rubber and Gasket Company, Incorporated, dba ARGCO
   2. Fire Protection Products Incorporated (FPPI)
   3. Or approved equivalent.

F. Switches, Valve Supervisory:
   1. Outside Screw and Yoke Valve Supervisory Switch:
      a. Potter Electric Signal Company; Model OSYSU-1, -2.
      b. System Sensor; Model OSY2 or OSYECP.
      c. Or approved equivalent.
   2. Post Indicator Valve (PIV) Control Valve Supervisory Switch:
      a. Potter Electric Signal Company; Model PCVS-1, -2.
      b. System Sensor; Model PIVB2 or PIVBEXP.
      c. Or approved equivalent.
   3. Non-Rising Stem Valve Supervisory Switch:
      a. Potter Electric Signal Company; Model PTS-C.
      b. System Sensor; Model PSP1.
      c. Or approved equivalent.
   4. Ball Valve Supervisory Switch:
      a. Potter Electric Signal Company; Model RBVS.
      b. System Sensor; Model PSP1.
      c. Or approved equivalent.
   5. Angle Valve Supervisory Switch:
      a. System Sensor; Model PSP1.
      b. Or approved equivalent.

G. Switches, Water Detector:
   1. Water Flow Switches:
      a. Wet Sprinkler Systems:
         1) Potter Electric Signal Company; Model VSR.
         2) System Sensor; Model WFD.
         3) Or approved equivalent.
   2. Pressure Operated Alarm Switches:
      a. Dry Pipe Sprinkler Systems:
         1) Detection of Water Flow:
            (a) Potter Electric Signal Company; Model PS10.
            (b) System Sensor; Model EPS or EPS EXT.
            (c) Or approved equivalent.
         2) Detection of Low Pressure:
            (a) Potter Electric Signal Company; Model PS40.
            (b) System Sensor; Model EPS or EPS EXP.
            (c) Or approved equivalent.

H. Hangers and Supports:
   1. Cooper B-Line Tolco:
      a. Ring Hangers:
         1) Model B3100, Figure 2000.
         2) Model B3100, Figure 2.
      b. U-Bolts: Model B3188.

c. Straps:
1) Figure 22.
2) Figure 22L2.
3) Figure 23.
4) Figure 24.
5) Figure 28.
6) Figure 29.
7) Model B3184.
d. Riser Clamps: Model B3373.
e. Pipe Clamps: Model B3140, Figure 4B.

2. Anvil International
3. ITW Buildex Sammys
4. Erico International
5. PHD Manufacturing Incorporated
6. Or approved equivalent.

I. Struts and Strut Clamps:
1. Struts:
a. Cooper B-Line Tolco
b. Or approved equivalent.
2. Strut Clamps:
a. Cooper B-Line Tolco; Model B2400.
b. Or approved equivalent.

J. Sway Braces and Restraints:
1. Cooper B-Line Tolco:
a. Fig. 75
b. Fig. 4A
c. Fig. 4L
d. Fig. 4LA
e. Fig. 800
f. Fig. 825
g. Fig. 825A
h. Fig. 828
i. Fig. 906
j. Fig. 910
k. Fig. 975
l. Fig. 980
m. Fig. 1000
n. Fig. 1001
o. Fig. 2002
2. Anvil International
3. Erico International
4. PHD Manufacturing Incorporated

5. Or approved equivalent.

K. Anchors and Attachments:

1. Concrete:
   a. Cast-In Place Anchors for Hangers:
      1) Cooper B-Line Tolco; Models 109, 109AF, B2500 with N2500 nut, or B3014 with B3014N nut.
      2) Erico International
      3) Or approved equivalent.
   b. Cast-In Place Anchors for Braces:
      1) Cooper B-Line Tolco; Models B2500 with N2500 nut, or B3014 with B3014N nut.
      2) Anvil International; Figure 282 with nut.
      3) Erico International
      4) Or approved equivalent.
   c. Attachments as specified or described by structural. If not specified or described by structural, then as follows:
      1) Hilti; Model Kwikbolt TZ
      2) Powers; Models Snake+, Power Stud+ SD2, or Powers Wedge-Bolt.
      3) Simpson Strong-Tie
      4) Or approved equivalent.
2. Wood:
   a. Cooper B-Line Tolco:
      1) Fig. 5D
      2) Fig. 51
      3) Fig. 56
      4) Fig. 58
      5) Fig. 78
      6) Fig. 120
      7) Fig. 130
   b. Anvil International
   c. Erico International
   d. ITW Buildex Sammys
   e. Or approved equivalent.
3. Steel:
   a. Cooper B-Line Tolco:
      1) Model B3037
      2) Model B3033
      3) Model B3034
      4) Fig. 65
      5) Fig. 66
      6) Fig. 67
      7) Fig. 68
      8) Fig. 69

9) Model B3042T
10) Fig. 22L2
11) Fig. 23
12) Fig. 24
13) Fig. 28
14) Fig. 78

b. Anvil International
c. Erico International
d. ITW Buildex Sammys
e. Or approved equivalent.

L. Pipe Stands:
1. Cooper B-Line Tolco; Fig B3092 with Fig. B3088ST.
2. Anvil International; Figure 259 with Figure 62 or 63.
3. Or approved equivalent.

M. Gauges:
1. Ashcroft; Model 105P-XUL.
2. US Gauge; Model 1590K.
3. Brecco
4. Reliable Automatic Sprinkler Company
5. Fire Protection Products, Incorporated (FPPI)
6. Allied Rubber and Gasket Company Incorporated, dba ARGCO
7. Wika Instrument Corporation
8. Or approved equivalent.

N. Bells:
1. Interior/Exterior Alarm Bells:
a. Potter; Model PB, 8-inch.
b. System Sensor
c. Or approved equivalent.

O. Fire Department Connection:
1. Guardian Fire Equipment
2. Fire End Croker Corporation
3. Potter-Roemer
4. Elkhart Brass
5. Tyco Fire & Building Products
6. Or approved equivalent.

P. Valves:
1. OS&Y Gate:
a. 175 PSI:
1) Nibco; Model F-607-0.
2) Mueller; Model R-2360-6.
3) Or approved equivalent.

b. 250 PSI:
   1) Victaulic; Model 771.
   2) Or approved equivalent.
c. 350 PSI:
   1) Nibco; Model F697-0.
   2) Or approved equivalent.
d. 2-inches and Smaller:
   1) Nibco; Model T-104.
   2) Or approved equivalent.

2. NRS Gate:
   a. 175 PSI:
      1) Nibco M/F-609 with Nibco NIP1A for yard use.
      2) Nibco M/F-609 with Nibco NIP2A for wall use.
      3) Or approved equivalent.
   b. 200 PSI:
      1) Mueller A-2361 with Mueller A-2080x indicator post for yard use.
      2) Mueller A-2361 with Mueller A-20813 wall type indicator post for wall use.
      3) Or approved equivalent.
   c. 250 PSI:
      1) Victaulic; Model 772, with Model 774 indicator post for yard use.
      2) Victaulic; Model 772, with Model 773 wall type indicator post for wall use.
      3) Or approved equivalent.
3. Swing Check:
   a. Victaulic; Model 717.
   b. Nibco; Model F-908-W.
   c. Mueller; Model A-2122-6.
   d. Viking Easy Riser Swing Check.
   e. Tyco; Model CV-1F.
   f. AnvilStar; Series 78FP.
   g. Or approved equivalent.
4. Wafer Check:
   a. Nibco; Model W-900-W.
   b. Mueller; Model A2102.
   c. Viking
   d. Tyco
   e. Or approved equivalent.
5. Butterfly Valves:
   a. Victaulic; Series 705, Series 707, Series 765, Series 766.
   b. Nibco; Model WD3510-8.
   c. Tyco; Model BFV-N.
   d. Use lug body next to pumps; Nibco; Model LD-3510-6.
   e. Or approved equivalent.

6. Pressure Relief:
    a. Watts; Model FP-53L.
    b. United Brass Works; Model 132.
    c. AGF
    d. Or approved equivalent.
7. Automatic Ball Drip Drain Valve:
    a. Tyco; Model AD-1,-2.
    b. Reliable Automatic Sprinkler Company
    c. Or approved equivalent.
8. Three-Way Gauge Valve:
    a. Fire Protection Products Incorporated (FPPI): 1/4-inch IPS, UL/ULC Listed, 300 psi.
    b. AGF Manufacturing Inc.; Model 7600, 1/4-inch 3-Way Globe Valve.
    c. Nibco; 400 PSI WWP Bronze Side Outlet Globe Valve KT-291-W3.
    d. Or approved equivalent.
9. Automatic Air Release Valve:
    a. Potter Electric Signal Company
    b. Or approved equivalent.
10. Ball Valve:
    a. Victaulic; Series 728.
    b. Apollo Valves; 64 Series, 1/4-inch through 2-inches.
    c. Fire Protection Products Incorporated (FPPI)
    d. Nibco; Models KX-505-W-8, KT-580-70-UL, or KT-585-70-UL.
    e. Or approved equivalent.

Q. Post Indicator Valve Assemblies:
1. Vertical Indicator Post for Non-Rising Stem Valve:
    a. Nibco; Model NIP-1AJ.
    b. Kennedy Valve; Model 2945A/2945.
    c. Mueller; Model A-20806/A-20807.
    d. Viking; Model 800.
    e. United Water Products; Model 5400.
    f. Or approved equivalent.
2. Horizontal Indicator Post for Non-Rising Stem Valve:
    a. Nibco; Model NIP-2AJ.
    b. Kennedy Valve; Model 641.
    c. Mueller; Model A-20814.
    d. Viking; Model IP888W.
    e. United Water Works
    f. Or approved equivalent.

3. Butterfly Valve Indicator Post Assemblies:
    a. Grooved butterfly valve with internal supervisory switch, steel wall plate, wall post assembly.
        1) Nibco; Model GD-4765-4WP.
        2) Or approved equivalent.

R. Backflow Prevention Devices:
1. Double Check Valve Assembly:
    a. Ames; Colt C200/C300.
    b. Ames; Maxim 200/300.
    c. Ames; Silver Bullet 2000SS/3000SS.
    d. Febco; Models 850/870 or 856/876.
    e. Zurn Wilkins; Model 350.
    f. Apollo Valves; Model DCDA4SG.
    g. Or approved equivalent.
2. Vault:
    a. Utility Vault
    b. Or approved equivalent.

S. Pipe, Valve, and Fire Protection Equipment Identification:
1. Fire Protection Products, Incorporated (FPPI)
2. Allied Rubber and Gasket Company, Incorporated, dba ARGCO
3. Or approved equivalent.

T. Signs:
1. Tyco Fire Products
2. Reliable Automatic Sprinkler
3. Viking Corporation
4. Allied Rubber and Gasket Company, Incorporated, dba ARGCO
5. Or approved equivalent.

U. Drains:
1. Reference Aboveground Black Steel Pipe and Fittings.
2. AGF
3. Victaulic
4. Or approved equivalent.

2.02 BURIED DUCTILE IRON PIPE AND FITTINGS

A. Pipe:
1. Thickness: Class 52 ductile iron, AWWA C151.
2. Pressure: 150 psi or 10.34 bar.
3. Cement mortar lined per AWWA C104, field encased with 8 mil polyethylene bag per AWWA C105. Coat all bolts, restraining rods, and the like with bitumastic prior to encasement in the polyethylene bag. Provide cathodic protection.

B. Fittings: AWWA C110, 350 psi or 24.13 bar. Cement mortar lined per AWWA C104, field encased with 8 mil polyethylene bag per AWWA C105. Coat all bolts, restraining rods, and the like with bitumastic prior to encasement in the polyethylene bag. Provide cathodic protection.

C. Fittings restrained with thrust blocks or restraining rods per NFPA 24.

D. Underground Valves: Factory coated with powdered epoxy or equivalent corrosion resistant coating. Bolts coated with bitumastic in the field. Encase the entire valve in 8-mil polyethylene bag in accordance with AWWA C-105. Provide cathodic protection.

E. Cathodic Protection: Sacrificial type, magnesium anodes, NACE Standard SP0169-13.

F. Test Stations: Comply with NACE Standards.

2.03 BURIED PVC (POLYVINYL CHLORIDE) PIPE AND FITTINGS

A. Pipe: SDR-18, AWWA C900.

B. Fittings:

1. AWWA C907, CSA B137.2.
2. PVC fittings restrained with thrust blocks per NFPA 24.
3. Underground Valves: Factory coated with powdered epoxy or equivalent corrosion resistant coating. Bolts coated with bitumastic in the field. Encase the entire valve in 8-mil polyethylene bag in accordance with AWWA C-105. Provide cathodic protection.

C. Install tracer wire on all non-metallic underground water lines. Type R.H.W., #10 A.W.G. stranded.

D. Cathodic Protection: Sacrificial type, magnesium anodes, NACE Standard SP0169-13.

2.04 JOINT RESTRAINTS

A. Mechanical joint wedge action for ductile iron pipe.

B. Gland: Ductile Iron.

C. Wedges: Ductile iron.

D. Full restraint pressure rating of pipe with minimum safety factor of 2:1.

2.05 ABOVEGROUND BLACK STEEL PIPE AND FITTINGS

A. Wet Pipe Systems:

1. Pipe Size 2-inch Diameter and Smaller: ASTM A53, ASTM A135, or ASTM A795; minimum of Schedule 40.
2. Pipe Size 2-1/2-inch Diameter and Larger: ASTM A53, ASTM A135, or ASTM A795; minimum of Schedule 10.
3. Exposed pipe 8-feet or less above finished floor: A minimum of Schedule 40.

B. Dry Pipe Systems:

1. Pipe Size 2-inch Diameter and Smaller: ASTM A53, ASTM A135, or ASTM A795; Schedule 40 only, shop welded, or threaded or cut grooved.
2. Pipe Size 2-1/2-inch Diameter and Larger: ASTM A53, ASTM A135, or ASTM A795; minimum of Schedule 10.

C. Exposed pipe 8-feet or less above finished floor: Minimum of Schedule 40.

D. Joints:

1. Threaded, flanged or bevel welded.
2. Piping installed in plenums or shafts to have welded joints.

E. Fittings:

1. Threaded:
   a. Malleable Iron: Class 150 and Class 300, ANSI B16.3.
   b. Cast Iron: Class 125 and 250, ANSI B16.3.
2. Flanged:
   a. Cast iron; Class 125 and 250, ASME B16.1.
   b. Raised ground face, bolt holes spot faced.

3. Welded:
    a. Carbon Steel: Long radius, standard weight or extra strong.
    b. Factory Wrought Steel Buttweld Fittings: ASME B16.9.
    c. Buttwelding Ends for Pipe, Valves, Flanges and Fittings: ASME B16.25.
    d. Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures: ASTM A234.
    e. Steel Pipe Flanges and Flanged Fittings: ASME B16.5.
    f. Forged Steel Fittings, Socket Welded and Threaded: ASME B16.11.
4. Mechanical Fittings and Grooved Couplings:
    a. Couplings: UL 213, AWWA C606, ASTM A536 ductile iron or ASTM A47 malleable iron, with enamel finish and grooves or shoulders designed to accept grooved couplings. Synthetic-rubber gasket with central-cavity, pressure-responsive design and ASTM A183 carbon-steel bolts and nuts.
    b. FM Global approved.

F. Anti-Microbial Coating: Factory-applied coating to inhibit corrosion from microbiological organisms.

2.06 WALL AND FLOOR PENETRATIONS AND SLEEVES

A. Below Grade and High Water Table Areas: Waterproof elastomeric compound.

2.07 SWITCHES, VALVE SUPERVISORY

A. Provide to mount on applicable, compatible valve (OS&Y gate, or PIV), with SPDT switches to match requirements of fire alarm system. Provide with cover tamper switch where required by AHJ.

2.08 SWITCHES, WATER DETECTOR

A. Provide with cover tamper switch where required by AHJ.

B. Water Flow Switches:
1. Vane-type; SPDT switches; electronic retard, adjustable time delay (0 to 75 seconds).
2. Wet Sprinkler Systems, NFPA 13: 450 PSI, 18-feet per second, 4-10 gpm.

C. Pressure Operated Alarm Switches: Pressure actuated with SPDT electrical switches and adjustable time delay (0 to 75 seconds).

2.09 HANGERS AND SUPPORTS

A. General: Select size of hangers and supports to exactly fit pipe size for bare piping.

B. Hangers:
1. Ferrous.
2. Stainless steel where subject to corrosion, corrosive vapors, or marine air.

C. Hanger Rods:
1. Concealed Spaces: Continuously threaded or threaded ends.
2. Exposed Spaces: Threaded ends.
3. Stainless steel where subject to corrosion, corrosive vapors, or marine air.

D. Finishes: Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.

E. Materials:
1. Use carbon steel pipe hangers and supports, metal trapeze pipe hangers and attachments for general service applications.

2. Use stainless steel hangers, rods and attachments for corrosive environment applications. Examples of corrosive environment applications include, but are not limited to: swimming pools and spas, pool and spa equipment rooms and adjacent areas, chemical rooms, kidney dialysis areas, marine and beach environments, commercial laundries and the like.

F. Anti-Scratch Padding: Use padded hangers for piping subject to scratching.

2.10 STRUTS AND STRUT CLAMPS

A. Electro-galvanized steel.

B. Designed for supporting pipe runs from strut supports.

C. UL listed for pipe up to 8-inches in diameter.

D. Stainless steel for corrosive environment applications. Examples of corrosive environment applications include, but are not limited to: swimming pools and spas, pool and spa equipment rooms and adjacent areas, chemical rooms, kidney dialysis areas, marine and beach environments, commercial laundries and the like.

2.11 SWAY BRACES AND RESTRAINTS

A. Sway Bracing: From a single manufacturer and compatible with sway brace calculation program.

B. Stainless steel for corrosive environment applications. Examples of corrosive environment applications include, but are not limited to: swimming pools and spas, pool and spa equipment rooms and adjacent areas, chemical rooms, kidney dialysis areas, marine and beach environments, commercial laundries, and the like.

2.12 ANCHORS AND ATTACHMENTS

A. General: Anchor supports to masonry, concrete and block walls per anchoring system manufacturer's recommendations, or as modified by project Structural Engineer.

B. Materials:

1. Ferrous.

2. Stainless steel for corrosive environment applications. Examples of corrosive environment applications include, but are not limited to: swimming pools and spas, pool and spa equipment rooms and adjacent areas, chemical rooms, kidney dialysis areas, marine and beach environments, commercial laundries, and the like.

C. Cast in Place Anchors for Hangers: Verify listing is for hangers, braces, or both.

D. Attachments in Concrete:

1. Suitable for hanging and bracing fire protection systems in concrete which is subject to cracking in a seismic event.

2. Seismic Design Areas C, D, E and F:

a. Compatible with International Code Council Evaluation Service Acceptance Criteria AC-193 and AC308 for expansion, screw and adhesive anchors. Meet requirements of ACI 355.2, Qualification of Post-Installed Mechanical Anchors in Concrete and Commentary.

b. All models of Hilti HDI and ITW Red Head Multi-Set II anchors are not approved for attaching fire protection systems in Seismic Design Areas C, D, E and F. No Exceptions.

E. ITW Buildex Sammys with FM Approval only are not allowed in certain seismic zones. Verify with FM that FM Approval is effective in project's seismic zone.

2.13 PIPE STANDS

A. Adjustable Pipe Saddle Support with Yoke:

1. Designed to support horizontal pipe from floor stanchion.

2. U-bolt and hex nuts to hold pipe securely to saddle or pipe clamp type.

3. ANSI/MSS SP-69; SP-58. Type 37.
4. Steel pipe with steel saddle.

B. Base Stand:
1. Steel pipe welded to steel base plate.
2. Meet requirements of 12X anchor diameter hole spacing for seismic applications.

2.14 GAUGES

A. Pressure Gauges: 3.5-inch, dial type, bronze bourdon tube or spring type, stainless steel case. 0 to 300 PSI.

2.15 BELLS

A. Exterior Alarm Bells: Minimum weatherproof backbox, typical 90 dBA at 10-feet.

2.16 FIRE DEPARTMENT CONNECTION

A. General:
1. Thread to match fire department hardware; automatic drip connected to drain; threaded dust cap and chain of same material and finish as body.
2. Provide with individual clappers.

B. Type: Free-Standing Type

C. Finish: Ductile Iron

D. Inlet Size: 2-1/2-inch.

E. Number of Inlets: Three.

F. Outlet Size: 4-inch.

G. Size of Pipe between Fire Department Connection and Sprinkler System: 6-inch.

H. Drain: 3/4-inch automatic ball drip, to outside.

I. Sign:
1. Class I Manual Standpipe / Auto Sprinkler Fire Department Connection

2.17 VALVES

A. OS&Y Gate:
1. 2-1/2-inches and Larger: Iron body.
2. 2-inches and Smaller: Bronze body.

B. NRS Gate:
1. Iron body. Non-rising stem with indicator post.
2. Underground Butterfly Valves: Telescopic barrel type.

C. Swing Check: Iron body, rubber and bronze faced checks.

D. Wafer Check: Iron body, rubber seat, spring actuated.

E. Butterfly Valves: Ductile iron body with factory-installed tamper switches. Use lug body next to pumps.

F. Pressure Relief: Bronze body, stainless steel spring.

G. Automatic Ball Drip Drain Valve: Bronze, spring-type.

H. Three-Way Gauge Valve: Brass; rated to 300 psi.

I. Automatic Air-Release Valve for Wet Systems:
1. Rated to 175 psi.
2. Automatic float-type with shutoff mounted in a water retention pan.
3. Single set 24VAC@2A for electronic supervision.

4. Ball valve switch with cover tamper.

J. Ball Valves: Brass body, brass stem; forged brass ball disc.

2.18 POST INDICATOR VALVE ASSEMBLIES

A. Vertical Indicator Post for Non-Rising Stem Valve:
   1. Indicates if valve is in open or shut position.
   2. Telescoping barrel type.
   3. Fixed length type.
   4. Flanged base.
   5. Mount for padlock.
   6. Mount for supervisory switch.

B. Horizontal Indicator Post for Non-Rising Stem Valve:
   1. Indicates if valve is in open or shut position.
   2. Used to operate a valve installed behind a wall.
   3. With a post flange to mount on a wall.
   4. Operated by a handwheel.
   5. Cast iron body.
   6. Mount for padlock.
   7. Mount for supervisory switch.

C. Butterfly Valve Indicator Post Assemblies:
   1. Grooved butterfly valve with internal supervisory switch, steel wall plate, wall post assembly.

2.19 BACKFLOW PREVENTION DEVICES

A. Double Check Valve Assembly:
   1. Two check valves in series with OS&Y gate or butterfly valves at each end.
   2. Provide detector if required by local utility.
   3. UL listed or FM Global Approved for fire suppression service as an assembly.
   4. Approved by local and state authorities, including project's State Department of Health for the position in which it is installed.

B. Utility Vault:
   1. Precast concrete underground sized to enclose the backflow prevention device and the fire department connection check valve, with adequate clearance around these Item to allow maintenance.
   2. Drain sump in vault bottom, suitable for insertion of a sump pump.
   3. Sump Pump
   4. Drain piping to approved discharge locations as required by local code officials.
   5. Costs for electrical connections and wiring as required for a complete and operable system.
   6. Provide watertight electrical penetrations. Provide piping penetrations with rubber links which seal watertight by tightening compression bolts, or equivalent watertight pre-manufactured pipe penetration system.
   7. Provide vault extensions as required for proper depth and round personnel access with cover and stainless steel or aluminum permanent ladder.

C. Provide Water Bureau approved Bypass-Meter and compatible Touch-Pad. Touch-Pad unit must be accessible from right-of-way.

2.20 PIPE, VALVE, AND FIRE PROTECTION EQUIPMENT IDENTIFICATION

A. Engraved plastic laminate or corrosion resistant metal sign or plastic equipment marker.

B. Corrosion-resistant chain or permanent adhesive.

2.21 SIGNS

A. Engraved plastic laminate or corrosion resistant metal sign or plastic equipment marker.

B. Corrosion-resistant chain or permanent adhesive.

2.22 DRAINS

A. Reference Aboveground Black Steel Pipe and Fittings.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Install in conformance with UL Listing, FM Approval or ICC-ES requirements and restrictions.

3.02 BURIED DUCTILE IRON PIPE AND FITTINGS

A. Pipe Sleeves:

1. Lay out work in advance of pouring concrete and furnish and set sleeves necessary to complete work.
2. Floor Sleeves: Provide sleeves on pipes passing through concrete or masonry construction. Extend sleeve 1-inch above finished floor. Caulk pipes passing through floor with nonshrinking firestopping, smokestopping and water stopping grout or approved equivalent caulking compound. Caulk/seal piping passing through fire rated building assembly with UL rated assemblies.
3. Wall Sleeves: Provide sleeves on pipes passing through concrete or masonry construction. Provide sleeve flush with finished face of wall. Caulk pipes passing through walls with nonshrinking caulking compound. Caulk/seal piping passing through fire-rated building assemblies with UL Listed or FM approved fire-rated firestopping compound. Provide fire-rated assemblies per local AHJ requirements.
4. Coordinate with trades for locations of pipe sleeves in reinforced concrete and steel beams. Penetrations must be indicated on structural shop drawings. See Drawings and Specifications for specific sleeve location limitations.

B. Buried Pipe:

1. Hydraulically calculated pipe to be of sufficient size as to deliver the required flow while not exceeding a flow velocity of 15-feet per second or as required in accordance with the water department requirements, whichever is less.
2. Excavation and Backfill:
   a. General: Perform necessary excavation and backfill required for installation of mechanical work. Repair piping or other work damaged by Contractor's operations.
   b. Water: Keep excavations free of standing water. Re-excavate and fill back excavations damaged or softened by water or frost to original level with sand, crushed rock or other approved material at no expense to Owner.
   c. Tests: During progress of work for compacted fill, Owner reserves right to request compaction tests made under direction of a testing laboratory.
   d. Cathodic Test Stations: Install on all ductile iron pipelines at a spacing of 800-feet to 1000-feet. Comply with NACE Standards.
   e. Trench Excavation: Excavate trenches to necessary depth and width, removing rocks, unstable soil (i.e. muck, peat and the like), roots and stumps. Excavation material is classified as "base fill" and "native." Base fill excavation material consisting of placed crushed rock may be used as backfill above "Pipe Zone." Remove and dispose off site native excavation material at no expense to Owner. Adequate width of trench for proper installation of piping or conduit.

f. Support Foundations:

1) Foundations: Excavate trenches located in unstable ground areas below elevation required for installation of piping to a depth which is determined by Architect as appropriate for conditions encountered. Place and compact approved foundation material in excavation up to "Bedding Zone." Dewatering, placement, compaction and disposal of excavated materials to conform to requirements contained in other Sections of Specifications or Drawings.

2) Over-Excavations: Where trench excavation exceeds required depths, provide, place and compact suitable bedding material to proper grade or elevation at no additional cost to Owner.

3) Foundation Material: Where native material has been removed, place and compact necessary foundation material to form a base for replacement of required thickness of bedding material.

4) Bedding Material: Full bed site piping on sand, pea gravel or 3/4-inch minus crushed rock. Place a minimum 4-inch deep layer of sand or crushed rock on leveled trench bottom for this purpose. Remove bedding to necessary depth for piping bells and couplings to maintain contact of pipe on bedding for its entire length. Provide additional bedding in excessively wet, unstable, or solid rock trench bottom conditions as required to provide a firm foundation.

g. Backfilling:

1) Following installation and successful completion of required tests, backfill piping in lifts.

(a) In "Pipe Zone," place backfill material and compact in lifts not to exceed 6-inches in depth to a height of 12-inches above top of pipe. Place backfill material to obtain contact with entire periphery of pipe, without disturbing or displacing pipe.

(b) Place and compact backfill above "Pipe Zone" in layers not to exceed 12-inches in depth.

2) Backfill Material:

(a) Backfill Material in "Pipe Zone": 3/4-inch minus crushed rock, sand or pea gravel.

(b) Crushed rock, fill sand or other backfill material approved elsewhere in Specifications may be used above "Pipe Zone."

h. Compaction of Trench Backfill:

1) Where compaction of trench backfill material is required, use one of following methods or combination thereof:

(a) Mechanical tamper,

(b) Vibratory compacter, or

(c) Other approved methods appropriate to conditions encountered.

2) Architect to have right to change methods and limits to better accommodate field conditions. Compaction sufficient to attain 95 percent of maximum density at optimum moisture content unless noted otherwise on Drawings or elsewhere in Specifications. Water "puddling" or "washing" is prohibited.

3.03 BURIED PVC (POLYVINYL CHLORIDE) PIPE AND FITTINGS

A. Securely fasten tracer wire to top of water line and place along the outside of transition to ductile iron pipe with one foot of slack placed adjacent to ductile iron pipe.

B. Buried Pipe:

1. Hydraulically calculated pipe to be of sufficient size as to deliver the required flow while not exceeding a flow velocity of 15-feet per second or as required in accordance with the water department requirements, whichever is less.
2. Excavation and Backfill:
   a. General: Perform necessary excavation and backfill required for installation of mechanical work. Repair piping or other work damaged by Contractor's operations.
   b. Water: Keep excavations free of standing water. Re-excavate and fill back excavations damaged or softened by water or frost to original level with sand, crushed rock or other approved material at no expense to Owner.
   c. Tests: During progress of work for compacted fill, Owner reserves right to request compaction tests made under direction of a testing laboratory.
   d. Trench Excavation: Excavate trenches to necessary depth and width, removing rocks, unstable soil (i.e. muck, peat and the like), roots and stumps. Excavation material is classified as "base fill" and "native." Base fill excavation material consisting of placed crushed rock may be used as backfill above "Pipe Zone." Remove and dispose off site native excavation material at no expense to Owner. Adequate width of trench for proper installation of piping or conduit.
   e. Support Foundations:
      1) Foundations: Excavate trenches located in unstable ground areas below elevation required for installation of piping to a depth which is determined by Architect as appropriate for conditions encountered. Place and compact approved foundation material in excavation up to "Bedding Zone." Dewatering, placement, compaction and disposal of excavated materials to conform to requirements contained in other Sections of Specifications or Drawings.
      2) Over-Excavations: Where trench excavation exceeds required depths, provide, place and compact suitable bedding material to proper grade or elevation at no additional cost to Owner.
      3) Foundation Material: Where native material has been removed, place and compact necessary foundation material to form a base for replacement of required thickness of bedding material.
      4) Bedding Material: Full bed site piping on sand, pea gravel or 3/4-inch minus crushed rock. Place a minimum 4-inch deep layer of sand or crushed rock on leveled trench bottom for this purpose. Remove bedding to necessary depth for piping bells and couplings to maintain contact of pipe on bedding for its entire length. Provide additional bedding in excessively wet, unstable, or solid rock trench bottom conditions as required to provide a firm foundation.
   f. Backfilling:
      1) Following installation and successful completion of required tests, backfill piping in lifts.
         (a) In "Pipe Zone," place backfill material and compact in lifts not to exceed 6-inches in depth to a height of 12-inches above top of pipe. Place backfill material to obtain contact with entire periphery of pipe, without disturbing or displacing pipe.
         (b) Place and compact backfill above "Pipe Zone" in layers not to exceed 12-inches in depth.
      2) Backfill Material:
         (a) Backfill Material in "Pipe Zone": 3/4-inch minus crushed rock, sand or pea gravel.

(b) Crushed rock, fill sand or other backfill material approved elsewhere in Specifications may be used above "Pipe Zone."

g. Compaction of Trench Backfill:

1) Where compaction of trench backfill material is required, use one of following methods or combination thereof:

(a) Mechanical tamper,

(b) Vibratory compacter, or

(c) Other approved methods appropriate to conditions encountered.

2) Architect to have right to change methods and limits to better accommodate field conditions. Compaction sufficient to attain 95 percent of maximum density at optimum moisture content unless noted otherwise on Drawings or elsewhere in Specifications. Water "puddling" or "washing" is prohibited.

3.04 JOINT RESTRAINTS

A. Install per manufacturer's instructions and recommendations.

B. Reference 3.01, General Installation Requirements.

3.05 ABOVEGROUND BLACK STEEL PIPE AND FITTINGS

A. Piping Routing:

1. Route piping, except as otherwise indicated, vertically and horizontally (sloped to drain). Avoid diagonal runs wherever possible. Orient horizontal routes parallel with walls and beam lines.

2. Install piping as shown or described by diagrams, details and notations on Drawings or, if not indicated, install piping to provide the shortest route which does not obstruct usable space or block access for servicing the building and its equipment.

3. Install piping in concealed spaces above finished ceilings. Prior to design and installation. obtain pre-approval by Architect for exposed piping.

4. In open-to-structure areas which are open to public view, route exposed piping to minimize visual impact. Obtain Architect's and Engineer's approval of exposed piping installation.

5. Coordinate installation with other trades. Route piping as required to avoid building structure, equipment, plumbing piping, HVAC piping, ductwork, lighting fixtures, electrical conduits and bus ducts and similar work. Final location of lighting will have priority over final sprinkler locations. Provide drains to trapped sections of system which result from such routing. Other trades take precedence for installation space.

6. Support piping adjacent to walls, overhead construction, columns and other structural and permanent enclosure elements of the building. Limit clearance to 2-inches wherever furring is indicated for concealment of piping. Allow for insulation thickness. Locate insulated piping to provide minimum 1-inch clearance outside insulation.

7. Wherever possible in finished and occupied spaces, conceal piping from view by locating within column or beam enclosures, hollow wall construction, or above suspended ceilings. Do not encase horizontal routes in solid partitions, except where approved.

8. General Electrical Equipment Clearances: Do not route piping through electrical rooms, transformer vaults, elevator equipment rooms and other electrical or electronic equipment spaces and enclosures. Within equipment rooms, provide minimum 3-feet lateral clearance from sides of electric switchgear panels. Do not route piping above electric power or lighting panel, switchgear, or similar electric device. Coordinate with electrical and coordinate exact pipe routing to provide proper clearance with such Item.

9. Route water filled and dry system piping around, not into or through, rooms protected by pre-action systems, clean-agent systems, gaseous suppression systems and other alternative fire suppression systems.

10. Install piping as close as possible to ceiling to avoid conflicts with other trades.
11. Install pipe runs to minimize obstruction to other work.
12. Pitch pipe for dry system piping passing through warm as well as cold areas.

B. Couplings:
1. Install where indicated on Drawings and on each side of pieces of equipment to permit easy removal of equipment.
2. Deburr cut edges.

C. Pipe Penetrations: Wire pipe cutout coupon at point of pipe penetration.

D. Pipe and Pipe Fittings:
1. Expansion and Flexibility: Install work with due regard for expansion and contraction to prevent damage to the piping, equipment, building and its contents. Provide piping offsets, loops, approved type expansion joints, sway bracing, wire restraints, vertical restraints, flexible couplings or other means to control pipe movement and to minimize pipe forces.
2. Coordinate support of pipe 4-inches and larger with Structural Engineer.
3. Provide clearances around piping per NFPA 13.
4. Pitch pipe for dry system piping located or passing through warm as well as cold areas.
5. Install welded pipe with welds facing vertically up, or where this is not possible, as close as possible to vertical between 46 degrees and 234 degrees. Intent is to minimize corrosion caused by moisture in the bottom of pipes.

3.06 WALL AND FLOOR PENETRATIONS AND SLEEVES

A. Escutcheons: Install on exposed pipes passing through walls or floors.
1. Pipe Sleeves: Lay out work in advance of pouring concrete and furnish and set sleeves necessary to complete work.
2. Floor Sleeves: Provide sleeves on pipes passing through concrete or masonry construction. Extend sleeve 1-inch above finished floor. Caulk pipes passing through floor with nonshrinking fire and water resistant grout or approved equivalent caulking compound. Caulk/seal piping passing through fire rated building assembly with UL rated assemblies. Provide fire-rated assemblies per local AHJ requirements.
3. Wall Sleeves: Provide sleeves on pipes passing through concrete or masonry construction. Provide sleeve flush with finished face of wall. Caulk pipes passing through walls with non-shrinking caulking compound. Caulk/seal piping passing through fire-rated building assemblies with UL Listed or FM Approved fire-rated firestopping compound. Provide fire-rated assemblies per local AHJ requirements.
4. Beam Sleeves:
   a. Coordinate with trades for locations of pipe sleeves in reinforced concrete and steel beams. Penetrations must be indicated on structural shop drawings. See Drawings and Specifications for specific sleeve location limitations. Pipe sleeve locations must be indicated on reinforced concrete and steel beam shop drawings. Field cutting of beams not allowed without written approval of structural engineer. No extra costs allowed for failure to coordinate beam penetrations prior to reinforced concrete and steel beam shop drawing submittal.
5. Penetrations in Fire-Rated Wall/Floor Assemblies:
   a. Reference Division 07, Thermal and Moisture Protection.
   b. Coordinate with Drawings location of fire rated walls, ceilings and floors. When these assemblies are penetrated, seal around piping and equipment with approved firestopping material.

c. Provide proper sizing when providing sleeves or core-drilled holes to accommodate the penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet the requirements of ASTM E814 and NFPA.

d. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM E814.

3.07 SWITCHES, VALVE SUPERVISORY

A. Coordinate with Division 28, Electronic Safety and Security.

3.08 SWITCHES, WATER DETECTOR

A. Wire pipe cutout coupon at point of connection of switch to pipe.

B. Flow switches: Connect to system side of valves and drain connections.

C. Coordinate with Division 28, Electronic Safety and Security.

3.09 HANGERS AND SUPPORTS

A. Installation of pipe hangers, inserts and supports to conform to NFPA 13. Provide adjustable hangers, inserts, brackets, clamps, supplementary steel and other accessory materials required for proper support of pipe lines and equipment. Provide supplementary materials for proper support and attachment of hangers.

B. Space pipe hangers no more than 4-feet on center for exposed sprinkler pipe located 8-feet or less above finished floor.

C. Limit branch line overhangs to 4-inches or less.

3.10 STRUTS AND STRUT CLAMPS

A. Install per manufacturer's listed orientation.

3.11 SWAY BRACES AND RESTRAINTS

A. Locate per orientation and spacing as required by sway brace calculations.

B. Attach sway bracing directly to pipe or equipment being braced.

C. Do not attach sway bracing to bottom of truss members.

3.12 ANCHORS AND ATTACHMENTS

A. In post-tension construction, determine location of post-tension cables and install anchors to avoid contact or interference with post-tension cables. Coordinate with Structural.

B. Do not use powder-driven attachments.

C. Building Attachments and Inserts: Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves and flanges, for sizes NPS 2-1/2 and larger. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

D. Hanger and Support Attachments:

1. Concrete:

a. Before Pouring: Support piping and equipment from malleable iron concrete form inserts placed before concrete is poured.

b. After Pouring:

1) Where supports in slabs are required after concrete has been poured, provide drilled-in threaded inserts (mechanical-expansion anchors), installed in accordance with manufacturer's recommendations.

2) Install mechanical-expansion anchors after concrete is completely cured and in accordance with manufacturer's installation instructions.

3) Where anchors are to be installed in post-tension construction, determine and avoid locations of post-tension cables prior to drilling.

2. Metal Floor Deck: Support hangers per UL Listing or FM Approval for selected concrete insert before pouring of concrete topping, or from beam clamps fastened to structural steel.
3. Steel Joists: Support hangers from beam clamps fastened to bar joists or to auxiliary steel between bar joists as required.
4. C-Clamp Hangers: Do not attach to one side of double-angle bottom members.
5. Locate and install hangers, supports and attachments connecting to I-joists, structural insulated panels (SIPs), cross laminated timber and similar engineered structural products according to the structural product manufacturer specifications.

E. Make available to the Architect information required to verify the anchorage, sway bracing and restraint of fire protection systems.

3.13 PIPE STANDS

A. Secure to floor.

B. Install to maintain pipe level and plumb.

C. Securely attach to supported pipe by u-bolt.

3.14 GAUGES

A. Install gauges conveniently and accessibly located with reference to finished building for repairs, removal and service.

B. Install with dial positioned for maximum visibility.

3.15 BELLS

A. Locate exterior alarm bells at 8-feet above finished grade. Coordinate with Architect.

B. Coordinate with Divisions 26, Electrical and Division 28, Electronic Safety and Security.

3.16 FIRE DEPARTMENT CONNECTION

A. Locate with sufficient clearance from walls, obstructions, or adjacent siamese connectors to allow full swing of fire department wrench handle.

B. Provide method of draining FDC piping. Drain to sanitary sewer by indirect connection, or to exterior where damage, including damage to landscaping and staining of concrete, will not occur.

C. Locate away from building egress paths. Coordinate location with Fire Marshal.

3.17 VALVES

A. General:

1. Provide post indicator on buried control valves.
2. Inspect valves for leaks. Adjust or replace packing to stop leaks. Replace valve if leak persists.

B. Installation:

1. Install valves where required for proper operation, testing and drainage. Locate valves so as to be accessible and so that separate support can be provided when necessary. Install conveniently and accessibly located with reference to finished building for repairs, removal and service.
2. Swing Check Valves: Install in horizontal position with hinge pin horizontally perpendicular to centerline of pipe. Install for proper direction of flow.
3. Wafer Check Valves: Install between two flanges in horizontal or vertical position, position for proper direction of flow.

C. Pressure Relief Valves: Provide piping to permanent drain.

3.18 POST INDICATOR VALVE ASSEMBLIES

A. Install plumb and conveniently and accessibly located with reference to finished building for repairs, removal and service.

B. Provide post indicator on buried control valves. Orient so “Open” and “Shut” signs are visible from street, or as required by AHJ.

C. Provide supervisory switch connected to fire alarm system.

3.19 BACKFLOW PREVENTION DEVICES

A. Install conveniently and accessibly located with reference to finished building for repairs, removal and service.

B. Provide listed backflow assembly at sprinkler system water source connection. Coordinate with local utility; conform to their installation requirements.

C. Provide method of forward flow testing at full system demand without dismantling any part of the system. Indicate location, method of testing and location of test drain discharge on submittal and As-Built Drawings. Provide signage as required by NFPA 13. Locate drainage for forward testing where damage will not occur, including damage to landscaping.

D. Chain and padlock in "open" position. Provide two sets of keys.

E. Provide control valve supervisory switches connected to the fire alarm system.

F. Reduced Pressure Backflow Preventer:

1. Locate within 5-feet of finished floor near drain shown on Plumbing Drawings or an existing drain of sufficient size which can accept full discharge of relief valve without doing damage or arrange and pay for installation of a suitable size drain.

2. Provide drain piping to sanitary sewer. Coordinate with Division 22, Plumbing.

3.20 PIPE, VALVE, AND FIRE PROTECTION EQUIPMENT IDENTIFICATION

A. Install engraved plastic laminate or corrosion resistant metal sign or plastic equipment marker, secured with corrosion-resistant chain or permanent adhesive on or near each Item of fire suppression equipment and each operational device, as specified in this specification if not otherwise specified for each Item or device. Provide signs for the following general categories of equipment and operational devices: Valves, drains, pumps, standpipes, tanks and similar equipment. Provide valve tag on every valve and control device in each piping system. Exclude check valves and valves within factory fabricated equipment units. List each tagged valve in valve schedule for each piping system.

B. Each new piece of equipment to bear a permanently attached identification plate, listing manufacturer's name, capacities, sizes and characteristics.

C. Piping to bear the manufacturer's name, schedule of thickness, size and ASTM identification number

D. Provide valve tag on every valve and control device in each piping system. Exclude check valves and valves within factory fabricated equipment units. List each tagged valve in valve schedule for each piping system.

E. Drain, Auxiliary Drain and Drum Drips: Provide valve tag on every valve in each fire suppression system. List each tagged valve and its location in valve schedule, identify on fire suppression drawings.

F. Install framed, glass or rigid transparent plastic covered, mounted valve schedule and valve location drawing in main riser or fire pump room.

G. Provide identification sign on ceiling tile below valve location.

H. Provide permanent identification sign at pressure regulating valves stating required setting of pressure regulator.

I. Adjusting: Relocate fire suppression identification device which has become visually blocked.

J. Cleaning: Clean face of identification devices and glass frames of valve charts.

3.21 SIGNS

A. General Information Signs: Provide a general information sign used to determine system design basis and information relevant to the inspection, testing and maintenance requirements required by NFPA 25, Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems. Such general information is to be provided with a permanently marked weatherproof metal or rigid plastic sign, secured with corrosion-resistant wire, chain, or other acceptable means. Such signs are to be placed at each system control rise loop and auxiliary system control valve. The sign is to include the following information:

1. Name and Location of the Facility Protected
2. Presence of High-Piled and/or Rack Storage
3. Maximum Height of Storage Planned
4. Flow Test Data
5. Location of Auxiliary Drains and Low Point Drains
6. Original Results of Main Drain Flow Test
7. Name of Installing Contractor or Designer
8. Indication of presence and location of other auxiliary systems.

B. Dry Signs: At system riser supplying dry systems, provide the following information: volume in gallons contained in each system.

3.22 DRAINS

A. Locate drain connections within 7-feet of floor. Provide piping capable of being fully drained.

B. Provide a drain vent at top of vertical drains. Coordinate with Division 22, Plumbing.

C. Coordinate location of auxiliary drains with Architect. Architect to approve location before drain is installed.

D. Protect drains from tampering and accidental operation.

E. Protect drain discharge at the exterior with a turned-down 45 degree elbow.

END OF SECTION

SECTION 22 00 00
PLUMBING BASIC REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Work included in 22 00 00, Plumbing Basic Requirements applies to Division 22, Plumbing work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of plumbing systems for proposed project.

B. Contract Documents include, but are not limited to, Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Drawings, Addenda, Owner/Architect Agreement, and Owner/Contractor Agreement. Confirm requirements before commencement of work.

C. Definitions:
   1. Provide: To furnish and install, complete and ready for intended use.
   2. Furnish: Supply and deliver to project site, ready for unpacking, assembly and installation.
   3. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at project site as required to complete items of work furnished.
   4. Approved or Approved Equivalent: To possess the same performance qualities and characteristics and fulfill the utilitarian function without any decrease in quality, durability or longevity. For equipment/products defined by the Contractor as "equivalent", substitution requests must be submitted to Engineer for consideration, in accordance with Division 01, General Requirements, and approved by the Engineer prior to submitting bids for substituted items.
   5. Authority Having Jurisdiction (AHJ): Indicates reviewing authorities, including local fire marshal, Owner's insurance underwriter, Owner's representative, and other reviewing entity whose approval is required to obtain systems acceptance.

1.02 RELATED SECTIONS

A. Contents of Section applies to Division 22, Plumbing Contract Documents.

B. Related Work:
   1. Additional conditions apply to this Division including, but not limited to:
      a. Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.
      b. Drawings
      c. Addenda
      d. Owner/Architect Agreement
      e. Owner/Contractor Agreement
      f. Codes, Standards, Public Ordinances and Permits

1.03 REFERENCES AND STANDARDS

A. References and Standards per Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, individual Division 22, Plumbing Sections and those listed in this Section.

B. Codes to include latest adopted editions, including current amendments, supplements and local jurisdiction requirements in effect as of the date of the Contract Documents, of/from:
   1. State of Oregon:
      a. OAR - Oregon Administrative Rules
      b. OESC - Oregon Electrical Specialty Code
      c. OFC - Oregon Fire Code
      d. OMSC - Oregon Mechanical Specialty Code
      e. OPSC - Oregon Plumbing Specialty Code
      f. OSSC - Oregon Structural Specialty Code

g. OEESC - Oregon Energy Efficiency Specialty Code
h. Oregon Elevator Specialty Code

C. Reference standards and guidelines include but are not limited to the latest adopted editions from:
1. ABA - Architectural Barriers Act
2. ADA - Americans with Disabilities Act
3. AHRI - Air-Conditioning Heating & Refrigeration Institute
4. ANSI - American National Standards Institute
5. ASCE - American Society of Civil Engineers
6. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers
7. ASHRAE Guideline 0, the Commissioning Process
8. ASME - American Society of Mechanical Engineers
9. ASPE - American Society of Plumbing Engineers
10. ASSE - American Society of Sanitary Engineering
11. ASTM - ASTM International
12. AWWA - American Water Works Association
13. CFR - Code of Federal Regulations
14. CISPI - Cast Iron Soil Pipe Institute
15. ETL - Electrical Testing Laboratories
16. EPA - Environmental Protection Agency
17. FM - FM Global
18. IAPMO - International Association of Plumbing and Mechanical Officials
19. GAMA - Gas Appliance Manufacturers Association
20. HI - Hydraulic Institute Standards
21. ISO - International Organization for Standardization
22. MSS - Manufacturers Standardization Society
23. NEC - National Electric Code
24. NEMA - National Electrical Manufacturers Association
25. NFGC - National Fuel Gas Code
26. NFPA - National Fire Protection Association
27. NRCA - National Roofing Contractors Association
28. NSF - National Sanitation Foundation
29. OSHA - Occupational Safety and Health Administration
30. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association, Inc.
31. TEMA - Tubular Exchanger Manufacturers Association
32. TIMA - Thermal Insulation Manufacturers Association
33. UL - Underwriters Laboratories Inc.

D. See Division 22, Plumbing individual Sections for additional references.

E. Where code requirements are at variance with Contract Documents, meet code requirements as a minimum requirement and include costs necessary to meet these in Contract. Machinery and equipment are to comply with OSHA requirements, as currently revised and interpreted for equipment manufacturer requirements. Install equipment provided per manufacturer recommendations.

F. Whenever this Specification calls for material, workmanship, arrangement or construction of higher quality and/or capacity than that required by governing codes, higher quality and/or capacity take precedence.

G. Piping Insulation products to contain less than 0.1 percent by weight PBDE in all insulating materials.

H. All potable water system components, devices, material, or equipment containing a weighted average of greater than 0.25 percent lead are prohibited, and shall be certified in accordance with current editions of the Safe Drinking Water Act (SDWA), NSF 61 & NSF 372. Endpoint devices used to dispense water for drinking shall meet the requirements of NSF 61.

1.04 SUBMITTALS

A. See Division 01, General Requirements for Submittal Procedures as well as specific individual Division 22, Plumbing Sections.

B. Provide drawings in format and software release equal to the design documents. Drawings to be the same sheet size and scale as the Contract Documents.

C. In addition:
   1. "No Exception Taken" constitutes that review is for general conformance with the design concept expressed in the Contract Documents for the limited purpose of checking for conformance with information given. Any action is subject to the requirements of the Contract Documents. Contractor is responsible for the dimensions and quantity and will confirm and correlate at the job site, fabrication processes and techniques of construction, coordination of the work with that of all other trades, and the satisfactory performance of the work.
   2. Provide product submittals and shop drawings in electronic format only. Electronic format must be submitted via zip file via e-mail. For electronic format, provide one zip file per specification division containing a separate file for each Specification Section. Individual submittals sent piecemeal in a per Specification Section method will be returned without review or comment. All transmissions/submissions to be submitted to Architect. Deviations will be returned without review.
   3. Product Data: Provide Manufacturer's descriptive literature for products specified in Division 22, Plumbing Sections.
   4. Identify/mark each submittal in detail. Note what differences, if any, exist between the submitted item and the specified item. Failure to identify the differences will be considered cause for disapproval. If differences are not identified and/or not discovered during the submittal review process, Contractor remains responsible for providing equipment and materials that meet the Specifications and Drawings.
      a. Label submittal to match numbering/references as shown in Contract Documents and schedules. Highlight and label applicable information to individual equipment or cross out/remove extraneous data not applicable to submitted model. Clearly note options and accessories to be provided, including field installed items. Highlight connections by/to other trades.
      b. Include technical data, installation instructions and dimensioned drawings for products, fixtures, equipment and devices installed, furnished or provided. Reference Division 22, Plumbing Sections for specific items required in product data submittal outside of these requirements.
      c. Provide pump curves, operation characteristics, capacities, ambient noise criteria, etc. for equipment.
      d. For vibration isolation of equipment, list make and model selected with operating load and deflection. Indicate frame type where required. Submit manufacturer's product data.
      e. See Division 22, Plumbing Sections for additional submittal requirements outside of these requirements.
   5. Maximum of two reviews of complete submittal package. Arrange for additional reviews and/or early review of long-lead items; Bear costs of additional reviews at Engineer's hourly rates. Incomplete submittal packages/submittals will be returned to contractor without review.
   6. Resubmission Requirements: Make corrections or changes in submittals as required, and in consideration of Engineer’s comments. Identify Engineer’s comments and provide an individual response to each of the Engineer’s comments. Cloud changes in the submittals and further identify changes which are in response to Engineer’s comments.
   7. Structural/Seismic: Provide weights, dimensions, mounting requirements and like information required for mounting, seismic bracing, and support. Indicate manufacturer's installation and support requirements to meet ASCE 7-10 requirements for non-structural

components. Provide engineered seismic drawings and equipment seismic certification. Equipment Importance Factor as specified in Division 01 and in Structural documents.

8. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required per Division 22, Plumbing Coordination Documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 26, Electrical submittals.
9. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.
10. Substitutions and Variation from Basis of Design:
    a. The Basis of Design designated product establishes the qualities and characteristics for the evaluation of any comparable products by other listed acceptable manufacturers if included in this Specification or included in an approved Substitution Request as judged by the Design Professional.
    b. If substitutions and/or equivalent equipment/products are being proposed, it is the responsibility of parties concerned, involved in, and furnishing the substitute and/or equivalent equipment to verify and compare the characteristics and requirements of that furnished to that specified and/or shown. If greater capacity and/or more materials and/or more labor is required for the rough-in, circuitry or connections than for the item specified and provided for, then provide compensation for additional charges required for the proper rough-in, circuitry and connections for the equipment being furnished. No additional charges above the Base Bid, including resulting charges for work performed under other Divisions, will be allowed for such revisions. Coordinate with the requirements of "Submittals". For any product marked "or approved equivalent", a substitution request must be submitted to Engineer for approval prior to purchase, delivery or installation.
11. Shop Drawings: Provide coordinated Shop Drawings which include physical characteristics of all systems, equipment and piping layout plans, and control wiring diagrams. Reference individual Division 22, Plumbing Sections for additional requirements for Shop Drawings outside of these requirements.
    a. Provide Shop Drawings indicating sanitary and storm cleanout locations and type to Architect for approval prior to installation.
    b. Provide Shop Drawings indicating access panel locations, size and elevation for approval prior to installation.
12. Samples: Provide samples when requested by individual Sections.
13. Resubmission Requirements:
    a. Make any corrections or change in submittals when required. Provide submittals as specified. The engineer will not be required to edit and/or interpret the Contractor's submittals. Indicate changes for the resubmittal in a cover letter with reference to page(s) changed and reference response to comment. Cloud changes in the submittals.
        1) Resubmit for review until review indicates no exception taken or "make corrections as noted".
        2) When submitting drawings for Engineers re-review, clearly indicate changes on drawings and "cloud" any revisions. Submit a list describing each change.
14. Operation and Maintenance Manuals, Owners Instructions:
    a. Submit, at one time, electronic files (PDF format) on CD/DVD of manufacturer's operation and maintenance instruction manuals and parts lists for equipment or items requiring servicing. Include valve charts. Submit data when work is substantially complete and in same order format as submittals. Include name and location of source parts and service for each piece of equipment.
        1) Include copy of approved submittal data along with submittal review letters received from Engineer. Data to clearly indicate installed equipment model numbers. Delete or cross out data pertaining to other equipment not specific to this project.

2) Include copy of manufacturer's standard Operations and Maintenance for equipment. At front of each tab, provide routine maintenance documentation for scheduled equipment. Include manufacturer's recommended maintenance schedule and highlight maintenance required to maintain warranty. Furnish list of routine maintenance parts, including part numbers, sizes, quantities, relevant to each piece of equipment: belts, motors, lubricants, and filters.
3) Include copy of complete parts list for equipment. Include available exploded views of assemblies and sub assemblies.
4) Include copy of startup and test reports specific to each piece of equipment.
5) Include copy of final water systems balancing log along with pump operating data.
6) Include commissioning reports.
7) Include copy of pressure, flow, leakage and purity test data and air and water systems test data, as applicable. Include copy of third-party and state and local jurisdiction inspection reports.
8) Include copy of valve charts/schedules.
9) Include Warranty per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.
10) Include product certificates of warranties and guarantees.
11) Engineer will return incomplete documentation without review. Engineer will provide one set of review comments in Submittal Review format. Contractor must arrange for additional reviews; Contractor to bear costs for additional reviews at Engineer's hourly rates.

b. Thoroughly instruct Owner in proper operation of equipment and systems. Where noted in individual Sections, training will include classroom instruction with applicable training aids and systems demonstrations. Field instruction per Section 22 00 00, Plumbing Basic Requirements article titled "Demonstration".
c. Copies of certificates of code authority inspections, acceptance, code required acceptance tests, letter of conformance and other special guarantees, certificates of warranties, specified elsewhere or indicated on Drawings.

15. Record Drawings:
a. Maintain at site at least one set of drawings for recording “As-constructed” conditions. Indicate on Drawings changes to original documents by referencing revision document, and include buried elements, location of cleanouts, and location of concealed mechanical items. Include items changed by field orders, supplemental instructions, and constructed conditions.
b. Record Drawings are to include equipment and fixture/connection schedules that accurately reflect "as constructed or installed" for project.
c. At completion of project, input changes to original project on CAD Drawings or Revit Model and make one set of black-line drawings created from CAD Files or Revit Model in version/release equal to contract drawings. Submit CAD or Revit disk and drawings upon substantial completion.
d. Provide Invert elevations and dimensioned locations for water services, building waste, and storm drainage piping below grade extending to 5-feet outside building line.
e. See Division 22, Plumbing individual Sections for additional items to include in record drawings.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements: Work and materials installed to conform with all local, State, Federal and other applicable laws and regulations.

B. Drawings are intended to be diagrammatic and reflect the Basis of Design manufacturers equipment. They are not intended to show every item in its exact dimensions, or details of equipment or proposed systems layout. Verify actual dimensions of systems (i.e., piping) and

equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than Basis of Design, including, but not limited to, architectural, structural, electrical, HVAC, fire sprinkler, and plumbing systems.

C. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect, in writing, before starting work.

D. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.

E. Provide products that are UL listed.

F. ASME Compliance: ASME listed water heaters and boilers with an input of 200,000 BTUH and higher, hot water storage tanks which exceed 120 gallons, and hot water expansion tanks which are connected to ASME rated equipment or required by code or local jurisdiction.

G. Provide safety controls required by National Boiler Code (ASME CSD 1) for boilers and water heaters with an input of 400,000 BTUH and higher.

1.06 WARRANTY

A. Provide written warranty covering the work for a period of one year from date of Substantial Completion in accordance with Division 00, Contracting and Procurement Requirements, Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

B. Sections under this Division can require additional and/or extended warranties that apply beyond basic warranty in Division 01, General Requirements and the General Conditions. Confirm requirements in all Contract Documents.

1.07 COORDINATION DOCUMENTS

A. Prior to construction, prepare and submit coordinated layout drawings (composite drawings) to coordinate installation and location of ductwork, grilles, diffusers, piping, fire sprinklers, plumbing, lights, and electrical services. Composite Drawings show services on single sheet. Key Drawings to structural column identification system. Prior to completion of Drawings, coordinate proposed installation with architectural and structural requirements, and other trades (including plumbing, HVAC, fire protection, electrical, ceiling suspension, and ceiling tile systems, etc.), and provide maintenance access requirements. Coordinate with submitted architectural systems (i.e. roofing, ceiling, finishes) and structural systems as submitted, including footings and foundation. Identify zone of influence from footings and ensure systems are not routed within the zone of influence. Unless otherwise required by Division 00, Procurement and Contracting Requirements and/or Division 01, General Requirements, Division 23, HVAC to combine information furnished by other trades onto master coordination documents.

B. Prepare Drawings as follows:
   1. Drawings in CAD Format or Revit Model. CAD format or Revit Model release equal to design documents. Drawings to be same sheet size and scale as Contract Drawings and indicate location, size and elevation above finished floor of equipment and distribution systems.
   2. Review and revise, as necessary, section cuts in Contract Drawings after verification of field conditions.
   3. Indicate plumbing system piping including fittings, hangers, access panels, valves, and bottom of pipe elevations above finished floor.
   4. Indicate inverts and provision for piping that must be graded to have right-of-way over more flexible items. Drawings also to indicate proposed ceiling grid and lighting layout as shown on electrical drawings and architectural reflected ceiling drawings and HVAC equipment, ductwork and piping.
   5. Incorporate Addenda items and change orders.

6. Distribute drawings to trades and provide additional coordination as requested by other trades.

C. Advise Architect in event conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.

D. Verify in field exact size, location, invert, and clearances regarding existing material, equipment and apparatus, and advise Architect of discrepancies between that indicated on Drawings and that existing in field prior to installation related thereto.

E. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

1.08 WORK INCLUDED

A. Furnish and install sleeves, inserts and anchorage required for the installation, which are embedded in work of other trades. Sleeve, wrap and seal piping in concrete.

B. Electrical: For plumbing trim/devices/equipment, provide, from the line voltage connection by Division 26, the low voltage electrical connections and wiring as required for complete and operable system. Includes, but is not limited to: Low voltage electrical raceway, wiring and accessories, such as step-down transformers as necessary for function of sensors and automatic valve and faucet controls. Supply step-down transformers and size wiring as recommended by manufacturer of plumbing trim/faucets requiring electrical low voltage connection.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Provide like items from one manufacturer, including but not limited to fixtures, pumps, drains and equipment.

2.02 MATERIALS

A. Base contract upon furnishing materials as specified. Materials, equipment, and fixtures used for construction are to be new, latest products as listed in manufacturer's printed catalog data and are to be UL approved or have adequate approval or be acceptable by State, County, and City authorities.

B. Articles, fixtures, and equipment of a kind to be standard product of one manufacturer.

C. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.

D. Hazardous Materials:
   1. Comply with local, State of Oregon, and Federal regulations relating to hazardous materials.
   2. Comply with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements for this project relating to hazardous materials.
   3. Do not use any materials containing a hazardous substance. If hazardous materials are encountered, do not disturb; immediately notify Owner and Architect. Hazardous materials will be removed by Owner under separate contract.

2.03 ACCESS PANELS

A. See Division 01, General Requirements and Division 08, Openings for products and installation requirements.

B. Confirm Access Panel requirements in Division 01, General Requirements, Division 08, Openings and individual Division 22, Plumbing Sections. In the absence of specific requirements, comply with the following:
   1. Provide flush mounting access panels for service of systems and individual components requiring maintenance or inspection. Where access panels are located in fire-rated assemblies of building, rate access panels accordingly.
      a. Ceiling access panels to be minimum 24-inch by 24-inch required and approved size.
      b. Wall access panels to be minimum of 12-inch by 12-inch required and approved size.
      c. Provide screwdriver operated catch.

d. Manufacturers and Models:
   1) Drywall: Karp KDW.
   2) Plaster: Karp DSC-214PL.
   3) Masonry: Karp DSC-214M.
   4) 2 hour rated: Karp KPF-350FR.
   5) Milcor, Elmdor, Acudor, or approved equivalent.

PART 3 - EXECUTION

3.01 ACCESSIBILITY AND INSTALLATION

A. Confirm Accessibility and Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

B. Install equipment requiring access (i.e., drain pans, drains, control operators, valves, motors, cleanouts and water heaters) so that they may be serviced, reset, replaced or recalibrated by service people with normal service tools and equipment. Do not install equipment in obvious passageways, doorways, scuttles or crawlspaces which would impede or block intended usage.

C. Install equipment and products complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of equipment and examine instructions thoroughly. When requirements of installation instructions conflict with Contract Documents, request clarification from Architect prior to proceeding with installation. This includes proper installation methods, sequencing, and coordination with other trades and disciplines.

D. Earthwork:
   1. Confirm Earthwork requirements in Contract Documents. In absence of specific requirements, comply with individual Division 22, Plumbing Sections and the following:
      a. Perform excavation, dewatering, shoring, bedding, and backfill required for installation of work in this Division in accordance with the provisions of related earthwork Sections/divisions. Contact utilities and locate existing utilities prior to excavation. Repair any work damaged during excavation or backfilling.
      b. Excavation: Do not excavate under footings, foundation bases, or retaining walls.
      c. Provide protection of underground systems. Review the project Geotechnical Report for references to corrosive or deleterious soils which will reduce the performance or service life of underground systems materials.

E. Firestopping:
   1. Confirm Firestopping requirements in Division 07, Thermal and Moisture Protection. In absence of specific requirements, comply with individual Division 22, Plumbing Sections and the following:
      a. Coordinate location and protection level of fire and/or smoke rated walls, ceilings, and floors. When these assemblies are penetrated, seal around piping, ductwork and equipment with approved firestopping material. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM E814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops.

F. Pipe Installation:
   1. Provide installation of piping systems coordinated to account for expansion and contraction of piping materials and building as well as anticipated settlement or shrinkage of building. Install work to prevent damage to piping, equipment, and building and its contents. Provide piping offsets, loops, expansion joints, sleeves, anchors or other means to control pipe movement and minimize forces on piping. Verify anticipated settlement and/or shrinkage of building with Project Structural Engineer. Verify construction phasing, type of building construction products and rating for coordinating installation of piping systems.
   2. Include provisions for servicing and removal of equipment without dismantling piping.

G. Plenums:
   1. Provide plenum rated materials that meet the requirements to be installed in plenums. Immediately notify Architect/Engineer of discrepancy.

3.02 SEISMIC CONTROL

A. Confirm Seismic Control requirements in Division 01, General Requirements, Structural documents, and individual Division 22 Plumbing Sections.

B. General:
   1. Earthquake resistant designs for Plumbing (Division 22) equipment and distribution, i.e. motors, plumbing systems, piping, equipment, water heaters, boilers, etc. to conform to regulations of jurisdiction having authority.
   2. Restraints which are used to prevent disruption of function of piece of equipment because of application of horizontal force to be such that forces are carried to frame of structure in such a way that frame will not be deflected when apparatus is attached to a mounting base and equipment pad, or to structure in normal way, utilizing attachments provided. Secure equipment and distribution systems to withstand a force in direction equal to value defined by jurisdiction having authority.
   3. Provide stamped Shop Drawings from licensed Structural Engineer of seismic bracing and seismic movement assemblies for piping equipment and water heaters. Submit Shop Drawings along with equipment submittals.
   4. Provide stamped Shop Drawings from licensed Structural Engineer of seismic flexible joints for piping and crossing building expansion or seismic joints. Submit Shop Drawings along with seismic bracing details.

C. Piping:
   1. Per "Seismic Restraints Manual Guidelines for Mechanical Systems" latest edition published by SMACNA or local requirements.

D. Provide means to prohibit excessive motion of plumbing equipment during earthquake.

3.03 REVIEW AND OBSERVATION

A. Confirm Review and Observation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

B. Notify Architect, in writing, at following stages of construction so that they may, at their option, visit site for review and construction observation:
   1. Underground piping installation prior to backfilling.
   2. Prior to covering walls.
   3. Prior to ceiling cover/installation.
   4. When main systems, or portions of, are being tested and ready for inspection by AHJ.

C. Bear responsibility and cost to make piping accessible, to expose concealed lines, or to demonstrate acceptability of the system. If Contractor fails to notify Architect at times prescribed above, costs incurred by removal of such work are the responsibility of the Contractor.

D. Final Punch:
   1. Prior to requesting a final punch visit from the Engineer, request from Engineer the Plumbing Precloseout Checklist, complete the checklist confirming completion of systems' installation, and return to Engineer. Request a final punch visit from the Engineer, upon Engineer's acceptance that the plumbing systems are ready for final punch.
   2. Costs incurred by additional trips required due to incomplete systems will be the responsibility of the Contractor.

3.04 CONTINUITY OF SERVICE

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Division 22, Plumbing Sections and the following:
   1. During remodeling or addition to existing structures, while existing structure is occupied, current services to remain intact until new construction, facilities or equipment is installed.
   2. Prior to changing over to new service, verify that every item is thoroughly prepared. Install new piping, and wiring to point of connection.
   3. Coordinate transfer time to new service with Owner. If required, perform transfer during off peak hours. Once changeover is started, pursue to its completion to keep interference to a minimum.
      a. If overtime is necessary, there will be no allowance made by Owner for extra expense for such overtime or shift work.
   4. Organize work to minimize duration of power interruption.

3.05 CUTTING AND PATCHING

A. Confirm Cutting and Patching requirements in Division 01, General Requirements. In absence of specific requirements, comply with individual Division 22, Plumbing Sections and the following:
   1. Proposed floor cutting/core drilling/sleeve locations to be approved by Project Structural Engineer. Submit proposed locations to Architect/Project Structural Engineer. Where slabs are of post tension construction, perform x-ray scan of proposed penetration locations and submit scan results including proposed penetration locations to Project Structural Engineer/Architect for approval. Where slabs are of waffle type construction, show column cap extent and cell locations relative to proposed penetration(s).
   2. Cutting, patching and repairing for work specified in this Division including plastering, masonry work, concrete work, carpentry work, and painting included under this Section will be performed by skilled craftsmen of each respective trade in conformance with appropriate Division of Work.
   3. Additional openings required in building construction to be made by drilling or cutting. Use of jack hammer is specifically prohibited. Patch openings in and through concrete and masonry with grout.
   4. Restore new or existing work that is cut and/or damaged to original condition. Patch and repair specifically where existing items have been removed. This includes repairing and painting walls, ceilings, etc. where existing piping and devices are removed as part of this project. Where alterations disturb lawns, paving, and walks, surfaces to be repaired, refinished and left in condition matching existing prior to commencement of work.
   5. Additional work required by lack of proper coordination will be provided at no additional cost to the Owner.

3.06 EQUIPMENT SELECTION AND SERVICEABILITY

A. Replace or reposition equipment which is too large or located incorrectly to permit servicing, at no additional cost to Owner.

3.07 DELIVERY, STORAGE AND HANDLING

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Division 22, Plumbing Sections and the following:
   1. Handle materials delivered to project site with care to avoid damage. Store materials on site inside building or protected from weather, dirt and construction dust. Insulation and lining that becomes wet from improper storage and handling to be replaced before installation. Products and/or materials that become damaged due to water, dirt and/or dust as a result of improper storage to be replaced before installation.
   2. Protect equipment and pipe to avoid damage. Close pipe openings with caps or plugs. Keep motors and bearings in watertight and dustproof covers during entire course of installation.

3. Protect bright finished shafts, bearing housings and similar items until in service.

3.08 DEMONSTRATION

A. Confirm Demonstration requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

B. Upon completion of work and adjustment of equipment and test systems, demonstrate to Owner's Representative, Architect and Engineer that equipment furnished and installed or connected under provisions of these Specifications functions in manner required. Provide field instruction to Owner's Maintenance Staff as specified in Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

C. Manufacturer's Field Services: Furnish services of a qualified person at time approved by Owner, to instruct maintenance personnel, correct defects or deficiencies, and demonstrate to satisfaction of Owner that entire system is operating in satisfactory manner and complies with requirements of other trades that may be required to complete work. Complete instruction and demonstration prior to final job site observations.

3.09 CLEANING

A. Confirm cleaning requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

B. Upon completion of installation, thoroughly clean exposed portions of equipment, removing temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated during work.

3.10 INSTALLATION

A. Confirm installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

B. Install equipment and fixtures in accordance with manufacturer's installation instructions, plumb and level and firmly anchored to vibration isolators. Maintain manufacturer's recommended clearances.

C. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
   1. Do not place equipment in sustained operation prior to initial balancing of plumbing systems.
   2. Provide pump impellers to obtain Basis of Design design capacities.

D. Provide miscellaneous supports/metals required for installation of equipment and piping.

3.11 PAINTING

A. Confirm requirements in Division 01, General Requirements and Division 09, Finishes. In absence of specific requirements, comply with individual Division 22, Plumbing Sections and the following:
   1. Ferrous Metal: After completion of plumbing work, thoroughly clean and paint exposed supports constructed of ferrous metal surfaces, i.e., hangers, hanger rods, equipment stands, with one coat of black asphalt for exterior or black enamel for interior, suitable for hot surfaces.
   2. In a mechanical room, on roof or other exposed areas, machinery and equipment not painted with enamel to receive two coats of primer and one coat of rustproof enamel, colors as selected by Architect.
   3. See individual equipment Specifications for other painting.
   4. Structural Steel: Repair damage to structural steel finishes or finishes of other materials damaged by cutting, welding or patching to match original.

5. Piping: Clean, primer coat and paint exposed piping on roof or at other exterior locations with two coats paint suitable for metallic surfaces and exterior exposures. Color selected by Architect.
6. Covers: Covers such as manholes, cleanouts and the like will be furnished with finishes which resist corrosion and rust.

3.12 ACCESS PANELS

A. Confirm Access Panel requirements in Division 01, General Requirements. In absence of specific requirements in Division 01, General Requirements, comply with individual Division 22, Plumbing Sections and the following:
   1. Coordinate locations/sizes of access panels with Architect prior to work. Label access panels with engraved nameplates indicating function of panel.

3.13 ACCEPTANCE

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Sections in Division 22, Plumbing and the following:
   1. System cannot be considered for acceptance until work is completed and demonstrated to Architect that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
      a. Testing and Balancing Reports
      b. Cleaning
      c. Operation and Maintenance Manuals
      d. Training of Operating Personnel
      e. Record Drawings
      f. Warranty and Guaranty Certificates
      g. Start-up/Test Document and Commissioning Reports

3.14 FIELD QUALITY CONTROL

A. Confirm Field Quality Control requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

B. Tests:
   1. Conduct tests of equipment and systems to demonstrate compliance with requirements specified. Reference individual Specification Sections for required tests. Document tests and include in operation and maintenance manuals.
   2. During site evaluations by Architect or Engineer, provide appropriate personnel with tools to remove and replace trims, covers, and devices so that proper evaluation of installation can be performed.

3.15 LETTER OF CONFORMANCE

A. Provide Letter of Conformance, copies of manufacturers' warranties and extended warranties with a statement that plumbing items were installed in accordance with manufacturer's recommendations, UL listings and FM Global approvals. Include Letter of Conformance, copies of manufacturers' warranties and extended warranties in Operation and Maintenance Manuals.

3.16 ELECTRICAL INTERLOCKS

A. Where equipment motors are to be electrically interlocked with other equipment for simultaneous operation, utilize plumbing equipment wiring diagrams to coordinate with electrical systems so that proper wiring of equipment involved is affected.

END OF SECTION

SECTION 22 10 00
PLUMBING PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Sanitary, Drainage (Rain/Stormwater) DWV Piping, Buried Within 5-feet of Building
   2. Sanitary, Drainage (Rain/Stormwater) DWV Piping, Above Grade
   3. Pump Waste Pressure Piping (Pumped Discharge)
   4. Water Piping, Buried Within 5-feet of Building
   5. Polyethelene Pipe (PE), Fittings and Valves
   6. Hot and Cold Domestic Water Above Grade
   7. Condensate Piping
   8. Primer Piping
   9. Cleanouts

1.02 RELATED SECTIONS

A. Contents of Division 22, Plumbing and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 22 00 00, Plumbing Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. NSF 61, Annex G.
   2. Steel pipe to conform to ASTM and ANSI Standards as specified in this Section.
   3. Copper piping to conform to ASTM B88, B306 and B208 and the standards of Copper Development Association (CDA), and American Welding Society, (AWS).
   4. Cast Iron Piping to conform to standards of ASTM A-74, CISPI 301 and FM 1680.
   5. Manufacturer's Standards Society (MSS) for valving and support reference standard.
   6. American Water Works Association (AWWA) for Valving Assembly Standards.
   7. American Society of Sanitation Engineers (ASSE) for Valving Standards.
   8. American National Standards Institute (ANSI) for Piping Standards.
   9. NFPA Standard 51B - “Fire Prevention in Use of Cutting and Welding Processes”.
   10. Crosslinked polyethylene (PEX) pipe conforming to ASTM F876, F877 and CSA B1375, or DIN 16892 and 16893.

1.04 SUBMITTALS

A. Submittals as required by Section 22 00 00, Plumbing Basic Requirements and Division 01, General Requirements.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 22 00 00, Plumbing Basic Requirements and Division 01, General Requirements.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 22 00 00, Plumbing Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. See component manufacturers listed in individual articles below.

B. Uponor

C. Cerro

D. Dodge Phelps

E. Tyler
F. ADS
G. Charlotte
H. Elkhart
I. Enfield
J. Fuseseal
K. Gruvlok
L. Spears
M. Nibco
N. Aquatherm
O. Orion
P. American-USA
Q. Sioux Chief
R. Or approved equivalent.
S. Cleanouts:
    1. J.R. Smith
    2. Zurn
    3. Wade
    4. Watts
    5. Sioux Chief
    6. Or approved equivalent.
T. Firestopping Penetrations in Fire Rated Wall Floor Assemblies:
    1. Hilti
    2. Proset
    3. Or approved equivalent.

2.02 GENERAL

A. Provide pipe, tube and fittings of the same type, fitting requirements, grade, class and the size and weight indicated or required for each service, as indicated in other Division 22, Plumbing Specifications. Where type, grade, or class is not indicated, provide proper selection as determined by installer for installation requirements, and comply with governing regulations and industry standards.
B. Manufactured materials delivered, new to the project site and stored in their original containers.
C. Product Marking: Each item to be furnished with legible markings indicating name brand and manufacturer, manufacturing process, heat number and markings as required per ASTM and UL/FM Standards.

2.03 SANITARY, DRAINAGE (RAIN/STORMWATER) DWV PIPING, BURIED WITHIN 5-FEET OF BUILDING

A. Cast Iron Pipe: ASTM A888/CISPI 301 hubless.
    1. Fittings: Cast iron.
    2. Coupling Assembly:
        a. Standard Duty: ASTM C1277 or CISPI 310.

2.04 SANITARY, DRAINAGE (RAIN/STORMWATER) DWV PIPING, ABOVE GRADE

A. Cast Iron Pipe: ASTM A888/CISPI 301 hubless.
    1. Fittings: Cast iron.
    2. Coupling Assembly:
        a. Standard Duty: ASTM C1277 or CISPI 310.

B. Copper Tube: ASTM B 306, DWV
   1. Fittings: ASME B16.29, wrought copper.
   2. Joints: ASTM B32, alloy Sn50 solder.

2.05 PUMP WASTE PRESSURE PIPING (PUMPED DISCHARGE)

A. Above Grade : Type "L" copper with solder joints.

B. Below Grade: Type "L" copper with brazed joints.

2.06 POLYETHELENE PIPE (PE), FITTINGS AND VALVES

A. Pipe: Manufactured from a PE resin meeting the short-term properties and long-term strength requirements of ASTM D2239, D2737, D3035 or CSA B137.1.

2.07 WATER PIPING, BURIED WITHIN 5-FEET OF BUILDING

A. Ductile Iron Pipe: AWWA C151/A21.51.
   1. Fittings: Ductile or gray iron, standard thickness.
   2. Joints: AWWA C111/A21.11, rubber gasket with 3/4-inch diameter rods, mega lug type.

2.08 HOT AND COLD DOMESTIC WATER ABOVE GRADE

A. Copper Tube: 3-inches and above. ASTM B88 (ASTM BA88m), Type L (B), Drawn.
   1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
   2. Joints: Brazed BCuP2.

B. Copper Tube: 2-1/2-inches and smaller. ASTM B88 (ASTM B88M), Type L (B), Drawn.
   1. Fittings: ASME B16.18 copper.
   2. Joints: ASTM B32, alloy Sn95 solder.

C. Copper Tube: Water pressures up to 250 PSI gauge. ASTM B 88 (ASTM BA 88m), Type K (A), Drawn.
   1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
   2. Joints: Brazed BCuP2.

D. Stainless steel roll grooved pipe: Water pressures up to 350 PSI gauge (3/4-inch threaded) stainless steel pipe, Schedule 10, conforming to ANSI AWWA-220 requirements.
   1. Fittings: Type 316/316L Schedule 10s fittings conforming to ASTM A403.
   2. Couplings: Type 316 stainless steel coupling conforming to ASTM A351 or ASTM A743.

E. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), Drawn.
   1. Fittings: ASME B16.22, wrought copper.
   2. Joints: Roll grooved mechanical coupling. ASTM A536.

F. Cross-Linked Polyethylene Tubing, Fittings and Accessories (except exposed locations.)
   1. Tubing:
      a. Cross-linked polyethylene (PEX) tubing complies with requirements of ASTM F876 and F877, and cross-linking method must be Type A (hot)method.
      b. PEX tubing to have minimum working pressure of not less than 160 PSI for water at 73.4 degrees F, 100 PSI for water at 180 degrees F and 80 PSI for water at 200 degrees F determined in accordance with Plastic Pipe Institute Technical Report TR-3/92, and listed in Plastic Pipe Institute Technical Report TR-4/95.
   2. Fittings:
      a. Fittings: Brass Fittings or Engineered Plastic Fittings above grade applications. Engineered plastic fittings below grade applications. Serrated type with reinforcement rings.
      b. Reinforcement Rings: Manufactured using "Engel Method" to ensure that viscoelastic stress regenerative properties are sufficient to produce pressure tight seal.
      c. Fitting Insert: Of such dimension in that tubing must be expanded in order to facilitate insertion of fitting into tube.
      d. Accomplish expansion of tubing and ring by an expansion tool designed expressly for that purpose.
      e. Fittings complies with requirements of ASTM F877.

3. Manifolds: Provide premanufactured copper manifolds of same manufacturer as piping.
4. Stubout Ells and Stubout Brackets: Provide premanufactured Type L copper stubout ells and copper stubout brackets.

2.09 CONDENSATE PIPING

A. Copper Tube: ASTM B 88 (ASTM B898M), Type K (A), L (B), or M (C)
   1. Fittings: ASME B16.29, wrought copper.
   2. Joints: ASTM B32, alloy Sn50 solder.

B. Piping for drainage of condensate from combustion fuel sources (such as condensing boilers and water heaters) is to be chemical resistant piping as noted in this Section for area of application.

2.10 PRIMER PIPING

A. Above Ground: Type L hard-drawn copper tubing with wrought sweat fittings and soldered joints.

B. Belowground: Cross-linked polyethylene (PEX) and engineered plastic fittings.

2.11 CLEANOUTS

A. General: Locate cleanouts as shown on Drawings and as required by local code. Cleanouts same size as pipe except that greater than 4-inches will not be required. Plastic components not allowed, except unless specifically noted.

B. Types:
   1. Tile Floor Cleanouts: J. R. Smith 4020 with round heavy-duty nickel bronze top, taper thread, ABS plug and standard screws.
   2. Carpeted Floor Cleanout: J. R. Smith 4020-X with carpet clamping frame, round heavy-duty nickel bronze top, taper thread, ABS plug, carpet clamping device and standard screws.
   3. Concrete Floor Cleanout (General): J. R. Smith 4020 with round heavy-duty nickel bronze top, taper thread and ABS plug with standard screws.
   4. Parking, Drives and Concrete Floor Cleanouts (Heavy Load): J. R. Smith 4100 with round heavy-duty nickel bronze top, taper thread and ABS plug with standard screws.
   5. Wall Cleanout: J. R. Smith 4472-U, countersunk bronze taper thread plug, stainless steel shallow cover and vandalproof screws.
   6. Outside Area Walks: J. R. Smith 4020-U with round heavy-duty nickel bronze top, taper thread, ABS plug and top secured with vandalproof screws. Install in 18- by 18- by 6-inch deep concrete pad flush with grade.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Underground Piping Systems Examination:
   1. Verify that excavations are to required grade, dry, and not over-excavated.

B. General:
   1. Perform necessary excavation and backfill required for installation of plumbing work. Repair piping or other work at no expense to Owner.
   2. Water: Keep excavations free of standing water. Reexcavate and fill back excavations damaged or softened by water or frost to original level with sand, crushed rock or other approved material at no expense to Owner.
   3. Tests: During progress of work for compacted fill, Owner reserves right to request compaction tests made under direction of testing laboratory.
   4. Trench Excavation: Excavate trenches to necessary depth and width, removing rocks, unstable soil (muck, peat), roots and stumps. Excavation material is classified as "base fill" and "native." Base fill excavation material consisting of placed crushed rock may be used as backfill above "Pipe Zone." Remove and dispose off site native excavation material. Adequate width of trench for proper installation of piping or conduit.

5. Support Foundations:
   a. Foundations: Excavate trenches located in unstable ground areas below elevation required for installation of piping to depth which is determined by Architect as appropriate for conditions encountered. Place and compact approved foundation material in excavation up to "Bedding Zone." Dewatering, placement, compaction and disposal of excavated materials to conform to requirements contained in other Sections of Specifications or Drawings.
   b. Over-Excavations: Where trench excavation exceeds required depths, provide, place and compact suitable bedding material to proper grade or elevation at no additional cost to Owner.
   c. Foundation Material: Where native material has been removed, place and compact necessary foundation material to form base for replacement of required thickness of bedding material.

	Class A		**Class B**	
Material Passing	**Min.**	**Max.**	**Min.**	**Max.**
3/4-inch Square Opening	**27**	**47**	**0**	**1**

   d. Bedding Material: Full bed piping on sand, pea gravel, or 3/4-inch minus crushed rock. Place minimum 4-inch deep layer of sand, pea gravel, or crushed rock on leveled trench bottom for this purpose. Remove bedding to necessary depth for piping bells and couplings to maintain contact of pipe on bedding for its entire length. Provide additional bedding in excessively wet, unstable, or solid rock trench bottom conditions as required to provide firm foundation.
6. Backfilling:
   a. Following installation and successful completion of required tests, backfill piping in lifts.
      1) In "Pipe Zone" place backfill material and compact in lifts not to exceed 6-inches in depth to height of 12-inches above top of pipe. Place backfill material to obtain contact with entire periphery of pipe, without disturbing or displacing pipe.
      2) Place and compact backfill above "Pipe Zone" in layers not to exceed 12-inches in depth.
   b. Backfill Material:
      1) Backfill Material in "Pipe Zone": 3/4-inch minus crushed rock, sand or pea gravel.
      2) Crushed rock, fill sand or other backfill material approved elsewhere in Specifications may be used above "Pipe Zone."
7. Compaction of Trench Backfill:
   a. Where compaction of trench backfill material is required, use one of following methods or combination thereof:
      1) Mechanical tamper,
      2) Vibratory compactor, or
      3) Other approved methods appropriate to conditions encountered.
   b. Architect to have right to change methods and limits to better accommodate field conditions. Compaction sufficient to attain 95 percent of maximum density at optimum moisture content unless noted otherwise on Drawings or elsewhere in Specifications. Water "puddling" or "washing" is prohibited.

C. General Installation:
   1. Work performed by experienced journeyman plumbers. No exceptions.
   2. Provide access panels for concealed valves, shock arrestors, trap primers and the like.

3. Install pipes and pipe fittings in accordance with recognized industry practices and manufacturer's recommendations.
4. Align piping accurately at connections, within 3/32-inch misalignment tolerance. Comply with ANSI B31 Code for Pressure Piping.
5. Locate piping runs, as indicated, vertically and horizontally (pitched to drain) and avoid diagonal runs wherever possible. Orient horizontal runs parallel with walls and column lines. Locate runs as shown or described by diagrams, details, and notations or, if not otherwise indicated, run piping in shortest route which does not obstruct space or block access for servicing building and its equipment. Hold piping close to walls, overhead construction, and other structural and permanent-enclosure elements of building. Limit clearance to 1/2-inch where furring is shown for enclosure or concealment of piping, but allow for insulation thickness, if any. Where possible, locate insulated piping for 1-inch clearance outside insulation. Whenever possible in finished and occupied spaces, conceal piping from view by locating it in column enclosures, hollow wall construction or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as indicated.
    a. Do not run piping through transformer vaults, telephone, elevator, electrical or electronic equipment spaces or enclosures unless indicated on Drawings.
    b. Concealed Piping Above Suspended Ceiling: Plan and coordinate to avoid interferences; install to maintain suspended ceiling heights shown on Architectural Drawings. Allow sufficient space above removable ceiling panels for panel removal. Locate piping so that valves are visible and accessible within 24-inches horizontally and vertically from point of access to the ceiling space. Provide plenum rated materials for ceiling spaces which are being used as plenums.
    c. Exposed Work: Run pipes parallel to the closest wall unless otherwise shown on Drawings; maintain maximum headroom; avoid light fixtures.
    d. Insulation Space Allowance: In piping work, allow space for pipe insulation and jackets. If interferences occur, move the piping to accommodate insulation thickness specified.
    e. Pipe Lengths: Do not use short lengths or nipples at locations where a full length of pipe will fit.
    f. Alignment Prior to Supporting and Anchoring: Place piping in proper alignment and position prior to connection to anchors, expansion loops, and equipment. Furnish jacking devices, temporary steel structural members, and assembled structures as necessary. Remove temporary equipment and structures supplied by contractor at completion; such items to remain Contractor property.
    g. Valve and Equipment Connections: Piping not to place undue stress on flanged valves and equipment connections. Mating flange faces to be true and parallel to each other and not to require springing of piping for assembly. Pipe hangers and supports to carry the full weight of the pipe and fluid.
    h. Piping Leaks: Correct immediately; use new materials; leak-sealing compounds or peening not permitted.
    i. Pressure Ratings of Fittings, Valves, and Devices in Piping Systems: Pressure rating to be equal to or greater than the maximum working pressure of the system.
    j. Equipment Vents and Drains: Provide for coils and vessels which contain water. Provide isolation valves and outlet valves at piping high and low points to permit venting and draining of the vessel without venting and draining connected piping. Provide hose connections and caps on drain lines.
    k. Escutcheon Plates: Where exposed insulated and uninsulated piping passes through walls, floors or ceilings; provide spring clip type. Provide plates on both sides of wall or floor.

D. Testing:
    1. General:
        a. Provide temporary equipment for testing, including pumps, compressors, tanks, and gauges, as required. Test piping systems before insulation (if any) is installed and remove or disengage control devices before testing. Where necessary, test sections

of each piping system independently, but do not use piping valves to isolate sections where test pressures exceed local valve operating pressure rating. Fill each section with water, compressed air, or nitrogen and pressurize for the indicated pressure and time.

b. Notify Architect and local Plumbing Inspector 2 days before tests.

c. Drainage, Waste and Vent Piping: Test in accordance with governing plumbing code or as follows: Test drainage and venting systems, with necessary openings plugged, to permit system to be filled with water and subjected to water pressure of minimum of 5 PSI head. System to hold water without water level drop greater than 1/2 pipe diameter of largest nominal pipe size within 24-hour period. Test system in sections if minimum head cannot be maintained in each section. 5 PSI head to be minimum pressure at highest joint.

d. Water Piping: Eliminate air from system. Fill and test at 125 PSIG or minimum 1-1/2 times static pressure at connection to serving utility main for period of two hours with no loss in pressure.

e. Send test results to Architect for review and approval and include in Operation and Maintenance Manual.

2. Testing of Pressurized Systems:

a. Test each pressurized piping system at 150 percent of operating pressure indicated, but not less than 125 PSIG test pressure.

b. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 2 percent of test pressure.

3. Test hot and cold domestic water piping systems upon completion of rough-in and before connection to fixtures at hydrostatic pressure of 125 PSIG.

E. Corrosive Soil Conditions:

1. Wrap steel, iron, copper or other metal piping materials/fittings with Protecto Wrap 200, 30 mils or greater. Maintain a 1/2-inch overlap and install per manufacturer's recommendations.

2. Provide epoxy coated cast iron pipe and fittings for drainage systems.

3. Obtain and review project soils report for verification of requirements concerning corrosive soils.

F. Protection:

1. Keep pipe openings closed by means of plugs or caps to prevent entrance of foreign matter. Protect piping, ductwork, fixtures, equipment and apparatus against dirty water, chemical or mechanical damage both before and after installation. Restore to its original condition or replace fixtures, equipment or apparatus damaged prior to final acceptance of work.

G. Firestopping Penetrations in Fire-Rated Wall/Floor Assemblies:

1. Provide proper sizing when providing sleeves or core-drilled holes to accommodate penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet requirements of ASTM E814.

H. Piping to be cut squarely, free of rough edges and reamed to full bore. Piping to be fully inserted into fittings.

I. Provide joints of type indicated in each piping system.

J. Thread pipe in accordance with ANSI/ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside diameter. Remove excess cutting oil from piping prior to assembly. Apply pipe joint compound, or pipe joint tape (Teflon) where recommended by pipe/fitting manufacturer, on male threads at each joint and tighten joint to leave not more than 3 threads exposed.

K. Sleeves:

1. Pipe Sleeves:

a. Layout work in advance of pouring concrete, furnish, and set sleeves necessary to complete work.

b. Floor Sleeves: Provide sleeves on pipes passing through concrete or masonry construction. Extend sleeve 1-inch above finished floor. Caulk pipes passing through floor with non-shrinking grout or approved caulking compound (Except DWV Piping penetrating a concrete slab set on finish grade), provide "Link-Seal" sleeve sealing system for concrete/slab penetrations which are below grade. Caulk/seal piping passing through fire rated building assembly with UL rated assemblies. Provide fire-rated assemblies per local AHJ requirements
c. Wall Sleeves: Provide sleeves on pipes passing through concrete or masonry construction. Provide sleeve flush with finished face of wall. Caulk pipes passing through walls with non-shrinking caulking compound. Provide modular link sealing system for concrete penetrations which are below grade. Caulk/seal piping passing through fire-rated assemblies per local AHJ requirements.
d. Beam Sleeves: Coordinate with trades for locations of pipe sleeves in reinforced concrete and steel beams. Indicate penetrations on structural shop drawings. See Drawings and Specifications for specific sleeve location limitations. Plumbing Drawings are diagrammatic. Offset piping as required to meet these limitations. Pipe sleeve locations must be indicated on reinforced concrete and steel beam shop drawings. Field cutting of beams not allowed without written approval of structural engineer. No extra costs allowed for failure to coordinate beam penetrations prior to reinforced concrete and steel beam shop drawing submittal.

2. Installation of metallic or plastic piping penetrations through non fire-rated walls and partitions and through smoke-rated walls and partitions:
   a. Install fabricated pipe sleeve.
   b. After installation of sleeve and piping, tightly pack entire annular void between piping or piping insulation and sleeve identification.
   c. Seal each end airtight with a resilient nonhardening seal per code.
3. Piping penetrations through fire-rated (1 to 3 hour) assemblies:
   a. Select and install pre-engineered pipe penetration system in accordance with UL listing and manufacturer's recommendation.
   b. Provide proper sizing when providing sleeves or core-drilled holes to accommodate penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet requirements of ASTM E84.

3.02 SANITARY, DRAINAGE (RAIN/STORMWATER) DWV PIPING, BURIED WITHIN 5-FEET OF BUILDING

A. Excavation and Backfill:
   1. See 3.01B. above.

B. Drainage, Waste and Vent Piping: Test in accordance with governing plumbing code or as follows: Test drainage and venting systems, with necessary openings plugged, to permit system to be filled with water and subjected to water pressure of minimum of 5 PSI head. System to hold water without water level drop greater than 1/2 pipe diameter of largest nominal pipe size within 24-hour period. Test system in sections if minimum head cannot be maintained in each section. 5 PSI head to be minimum pressure at highest joint.

C. Corrosive Soil Conditions:
   1. Wrap steel, iron, copper or other metal piping materials/fittings with Protecto Wrap 200, 30 mils or greater. Maintain a 1/2-inch overlap and install per manufacturer's requirements.
   2. Provide epoxy coated cast iron pipe and fittings for drainage systems.

D. Cast-Iron Joints: Comply with coupling manufacturer's Cast Iron Soil Pipe Institute Standards and installation instructions.

E. Sanitary and Storm Drainage:
   1. Piping to be graded at a uniform pitch of 2 percent unless otherwise noted on Drawings.
   2. Indirect Waste or Drain Piping: Extend piping to discharge as shown on Drawings. Maintain minimum air gap. Provide traps on direct waste or drain piping exceeding 60-inches.

3. Fixture Carriers: Concealed fixture carriers for wall hung plumbing fixtures are specified in Section 22 40 00.
4. Drains:
   a. Install drains to suit finished floor or roof surface. Install drains and components per manufacturer's instructions. Arrange for flooring to be sloped to floor drain or sink a minimum of 1/2-inch below finished floor elevation.
   b. Install P-traps for hub drains, floor drains and floor sinks. P-traps to be of the same materials as soil and waste piping. Provide trap primer assembly for each drain or floor sink.
5. Wall Access Panel: Secure to wall framing and install so that flange forms a close fitting joint with the finished wall surface.
6. Heat trace and insulate P-traps exposed to freezing conditions. Provide heat trace and electronic components to Division 26 for installation.
7. Insulate horizontal branch lines from floor sinks, receptors and drains receiving cold discharge from equipment and appliances.

F. Epoxy Coated Cast Iron Pipe and Fittings: Coating of cut piping: The piping terminus of any cut piping shall be coated with an applied epoxy per manufacturer's instructions. Denso - Protal 7200 fast cure epoxy repair coating.

3.03 SANITARY, DRAINAGE (RAIN/STORMWATER) DWV PIPING, ABOVE GRADE

A. Drainage, Waste and Vent Piping: Test in accordance with governing plumbing code or as follows: Test drainage and venting systems, with necessary openings plugged, to permit system to be filled with water and subjected to water pressure of minimum of 5 PSI head. System to hold water without water level drop greater than 1/2 pipe diameter of largest nominal pipe size within 24-hour period. Test system in sections if minimum head cannot be maintained in each section. 5 PSI head to be minimum pressure at highest joint.

B. Firestopping Penetrations in Fire-Rated Wall/Floor Assemblies:
1. Provide proper sizing when providing sleeves or core-drilled holes to accommodate penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet requirements of ASTM E814.

C. Solder copper tube and fitting joints with lead free nickel/silver bearing solder meeting ASTM std. B-32, in accordance with IAPMO Is 3-93, ASTM B-828 and Copper Development Association recommended procedures. Joints to be cleaned by other than chemical means prior to assembly. "Shock" cooling is prohibited. Fluxes to be water soluble for copper and brass potable water applications, and meets CDA standard test method 1.0 and ASTM B813-91. Solder to be applied until a full fillet is present around the joint. Solder and flux not to be applied in such excessive quantities as to run down interior of pipe. Lead solder or corrosion flux not to be present at the jobsite.

D. Cast-Iron Joints: Comply with coupling manufacturer's Cast Iron Soil Pipe Institute Standards and installation instructions.

E. Sanitary and Storm Drainage:
1. Piping to be graded at a uniform pitch of 2 percent unless otherwise noted on Drawings.
2. Indirect Waste or Drain Piping: Extend piping to discharge as shown on Drawings. Maintain minimum air gap. Provide traps on direct waste or drain piping exceeding 60-inches.
3. Fixture Carriers: Concealed fixture carriers for wall hung plumbing fixtures are specified in Section 22 40 00.
4. Drains:
   a. Install drains to suit finished floor or roof surface. Install drains and components per manufacturer's instructions. Arrange for flooring to be sloped to floor drain or sink a minimum of 1/2-inch below finished floor elevation.
   b. Install P-traps for hub drains, floor drains and floor sinks. P-traps to be of the same materials as soil and waste piping. Provide trap primer assembly for each drain or floor sink.

5. Wall Access Panel: Secure to wall framing and install so that flange forms a close fitting joint with the finished wall surface.
6. Heat trace and insulate P-traps exposed to freezing conditions. Provide heat trace and electronic components to Division 26 for installation.
7. Insulate horizontal branch lines from floor sinks, receptors and drains receiving cold discharge from equipment and appliances.

3.04 PUMP WASTE PRESSURE PIPING (PUMPED DISCHARGE)

A. Excavation and Backfill:
   1. See 3.01 B. above.

B. Drainage, Waste and Vent Piping: Test in accordance with governing plumbing code or as follows: Test drainage and venting systems, with necessary openings plugged, to permit system to be filled with water and subjected to water pressure of minimum of 5 PSI head. System to hold water without water level drop greater than 1/2 pipe diameter of largest nominal pipe size within 24-hour period. Test system in sections if minimum head cannot be maintained in each section. 5 PSI head to be minimum pressure at highest joint.

C. Testing of Pressurized Systems:
   1. Test each pressurized piping system at 150 percent of operating pressure indicated, but not less than 125 PSIG test pressure.
   2. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 2 percent of test pressure.

D. Firestopping Penetrations in Fire-Rated Wall/Floor Assemblies:
   1. Provide proper sizing when providing sleeves or core-drilled holes to accommodate penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet requirements of ASTM E814.

E. Braze copper tube and fitting socket with BCUP series filler metal without flux. Listed brazing flux to be used for joining of copper tube to brass or bronze fittings and will meet AWS FB3A or FB3C. "Shock" cooling is prohibited. a continuous fillet is to be visible around the completed joint. After cooling, flux residue to be thoroughly removed with warm water and a brush prior to testing. Do not use BCUP filler on copper alloys containing over 10 percent nickel. Piping is to be capped or plugged during construction to prevent entry of foreign material.

F. Welders performing work under this Contract to be certified and qualified in accordance with tests prescribed by the National Certified Welding Bureau (NCWB) or by other approved test procedures using methodology and procedures covered in the ASME Boiler and Pressure Vessel Code, Section IX, "Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators". Installation to conform to ANSI 31.1 "Power Piping".
   1. Submit for approval the names, identification, and welder's assigned number, letter or symbol for welders assigned to this project.
   2. The assigned identification symbol to be used to identify the work of each welder and to be indelibly stamped immediately upon completion of each weld.
   3. Welders to be tested and certified for all positions.
   4. Submit identifying stenciled test coupons made by each operator.
   5. Welders may be required to retake welding certification tests without additional expense.
   6. When so requested, a welder will not be permitted to work as a welder on this project until he has been recertified in accordance with NCWB.
   7. Recertification of the welder to be made after the welder has taken and passed the required tests.

G. Weld pipe joints in accordance with recognized industry practice and as follows:
   1. Weld pipe joints only when ambient temperature is above 0F.
   2. Bevel pipe ends at a 37.5 degree angle where possible, smooth rough cuts, and clean to remove slag, metal particles, and dirt.

3. Use pipe clamps or tack-weld joints with 1-inch long welds, 4 welds for pipe sizes to 10-inches, 8 welds for pipe sizes 12-inches to 20-inches.
4. Build up welds with a stringer-bead pass, followed by a hot pass, followed by a cover or filler pass. Eliminate valleys at center and at edges of each weld. Weld by procedures which will ensure elimination of unsound or unfused metal, cracks, oxidation, blow-holes, and non-metallic inclusions.
5. Do not weld out piping system imperfections by tack-welding procedures. Re-fabricate to comply with requirements.
6. At Installer's option, install forged branch-connection fittings whenever branch pipe is indicated, or install a regular T-fitting.

H. Sanitary and Storm Drainage:
1. Piping to be graded at a uniform pitch of 2 percent unless otherwise noted on Drawings.
2. Indirect Waste or Drain Piping: Extend piping to discharge as shown on Drawings. Maintain minimum air gap. Provide traps on direct waste or drain piping exceeding 60-inches.
3. Fixture Carriers: Concealed fixture carriers for wall hung plumbing fixtures are specified in Section 22 40 00.
4. Drains:
   a. Install drains to suit finished floor or roof surface. Install drains and components per manufacturer's instructions. Arrange for flooring to be sloped to floor drain or sink a minimum of 1/2-inch below finished floor elevation.
   b. Install P-traps for hub drains, floor drains and floor sinks. P-traps to be of the same materials as soil and waste piping. Provide trap primer assembly for each drain or floor sink.
5. Wall Access Panel: Secure to wall framing and install so that flange forms a close fitting joint with the finished wall surface.
6. Heat trace and insulate P-traps exposed to freezing conditions. Provide heat trace and electronic components to Division 26 for installation.
7. Insulate horizontal branch lines from floor sinks, receptors and drains receiving cold discharge from equipment and appliances.

3.05 WATER PIPING, BURIED WITHIN 5-FEET OF BUILDING

A. Excavation and Backfill:
1. See 3.01 B. above.

B. Water Piping: Eliminate air from system. Fill and test at 125 PSIG or minimum 1-1/2 times static pressure at connection to serving utility main for period of two hours with no loss in pressure.

C. Domestic Water:
1. "Piping" to include pipes, fittings, nipples, valves and accessories connected thereto.
2. Run piping generally parallel to the axis of the building, arranged to conform to the building requirements and to suit the necessities of clearance for other mechanical ducts, flues, conduits and work of other trades, and as close to ceiling or other construction as practical, free of unnecessary traps or bends.
3. Grade water supply piping for complete drainage of the system. Install hose bibbs at low points.
4. Piping connections to equipment to be made up with unions.
5. Provide sufficient elbows, swings and offsets to permit free expansion and contraction.
6. Use reducers or increasers. Use no bushings.
7. Ream or file each pipe to remove burrs. Inspect each length of pipe and each fitting for workmanship and clear passageways.
8. Cover, cap or otherwise protect open ends of piping during construction to prevent damage to threads or flanges and prevent entry of foreign matter. Disinfect and sterilize water supply piping as specified. Furnish written report on final water quality results.
9. Exposed connections to equipment to be installed with special care, showing no tool marks or threads at fittings and piping. No bowed or bent piping to be permitted.

10. Ferrous to non-ferrous connections to be made by means of dielectric fittings.
11. Use extra heavy pipe for nipples, where unthreaded portion is less than 1-1/2-inches. Use no close nipples. Use only shoulder-type nipples.
12. Through-Wall Pipes: Type 'L' copper tubing for through-wall pipes which connect to exposed stops at wall surface. Anchor the pipes in the wall; attach pipe with U-bolts to steel back-up plates or steel angles anchored in the wall. Provide wrought copper elbow which securely anchors ears in wall at through-wall pipes.
13. Provide drain valves at base of risers and at low points on the system.
14. Backflow Preventers: Pipe relief to nearest drain. Slope at 2 percent.

D. Sterilization of Domestic Water System:
1. General: Upon completion of tests and necessary replacements, thoroughly flush and disinfect domestic water piping.
2. Method: After thoroughly flushing system with water to remove sediment, fill system with a solution containing 50 parts per million of chlorine for not less than 24 hours or 200 parts per million of chlorine for not less than 3 hours. After retention, drain, reflush and return system to service.
3. Certification: Provide copy of domestic water chlorination certificate in each operations and maintenance manual.
4. Provide water line disinfections performed by a licensed contractor with training in potable water line disinfections.

E. Buried Preinsulated Pipe Installation:
1. Installation and Testing: Install and test products in accordance with manufacturer’s installation instructions.
2. Manufacturer’s installation instructions shall describe the following:
a. Storage and handling of pipes.
b. Trench preparation.
c. Installing pipe.
d. Installing accessories.
e. Installing fittings.
f. Building penetrations.
g. Field insulation kits.
h. Testing.

3.06 HOT AND COLD DOMESTIC WATER ABOVE GRADE

A. Water Piping: Eliminate air from system. Fill and test at 125 PSIG or minimum 1-1/2 times static pressure at connection to serving utility main for period of two hours with no loss in pressure.

B. Testing of Pressurized Systems:
1. Test each pressurized piping system at 150 percent of operating pressure indicated, but not less than 125 PSIG test pressure.
2. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 2 percent of test pressure.

C. Test hot and cold domestic water piping systems upon completion of rough-in and before connection to fixtures at hydrostatic pressure of 125 PSIG.

D. Firestopping Penetrations in Fire-Rated Wall/Floor Assemblies:
1. Provide proper sizing when providing sleeves or core-drilled holes to accommodate penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet requirements of ASTM E814.

E. Solder copper tube and fitting joints with lead free nickel/silver bearing solder meeting ASTM std. B-32, in accordance with IAPMO Is 3-93, ASTM B-828 and Copper Development Association recommended procedures. Joints to be cleaned by other than chemical means prior to assembly. "Shock" cooling is prohibited. Fluxes to be water soluble for copper and brass potable water applications, and meets CDA standard test method 1.0 and ASTM B813-91. Solder to be applied until a full fillet is present around the joint. Solder and flux not to be

applied in such excessive quantities as to run down interior of pipe. Lead solder or corrosion flux not to be present at the jobsite.

F. Braze copper tube and fitting socket with BCUP series filler metal without flux. Listed brazing flux to be used for joining of copper tube to brass or bronze fittings and will meet AWS FB3A or FB3C. "Shock" cooling is prohibited. a continuous fillet is to be visible around the completed joint. After cooling, flux residue to be thoroughly removed with warm water and a brush prior to testing. Do not use BCUP filler on copper alloys containing over 10 percent nickel. Piping is to be capped or plugged during construction to prevent entry of foreign material.

G. Domestic Water:
   1. "Piping" to include pipes, fittings, nipples, valves and accessories connected thereto.
   2. Run piping generally parallel to the axis of the building, arranged to conform to the building requirements and to suit the necessities of clearance for other mechanical ducts, flues, conduits and work of other trades, and as close to ceiling or other construction as practical, free of unnecessary traps or bends.
   3. Grade water supply piping for complete drainage of the system. Install hose bibbs at low points.
   4. Piping connections to equipment to be made up with unions.
   5. Provide sufficient elbows, swings and offsets to permit free expansion and contraction.
   6. Use reducers or increasers. Use no bushings.
   7. Ream or file each pipe to remove burrs. Inspect each length of pipe and each fitting for workmanship and clear passageways.
   8. Cover, cap or otherwise protect open ends of piping during construction to prevent damage to threads or flanges and prevent entry of foreign matter. Disinfect and sterilize water supply piping as specified. Furnish written report on final water quality results.
   9. Exposed connections to equipment to be installed with special care, showing no tool marks or threads at fittings and piping. No bowed or bent piping to be permitted.
   10. Ferrous to non-ferrous connections to be made by means of dielectric fittings.
   11. Use extra heavy pipe for nipples, where unthreaded portion is less than 1-1/2-inches. Use no close nipples. Use only shoulder-type nipples.
   12. Through-Wall Pipes: Type 'L' copper tubing for through-wall pipes which connect to exposed stops at wall surface. Anchor the pipes in the wall; attach pipe with U-bolts to steel back-up plates or steel angles anchored in the wall. Provide wrought copper elbow which securely anchors ears in wall at through-wall pipes.
   13. Provide drain valves at base of risers and at low points on the system.
   14. Backflow Preventers: Pipe relief to nearest drain. Slope at 2 percent.

H. Sterilization of Domestic Water System:
   1. General: Upon completion of tests and necessary replacements, thoroughly flush and disinfect domestic water piping.
   2. Method: After thoroughly flushing system with water to remove sediment, fill system with a solution containing 50 parts per million of chlorine for not less than 24 hours or 200 parts per million of chlorine for not less than 3 hours. After retention, drain, reflush and return system to service.
   3. Certification: Provide copy of domestic water chlorination certificate in each operations and maintenance manual.
   4. Provide water line disinfections performed by a licensed contractor with training in potable water line disinfections.

3.07 CONDENSATE PIPING

A. Firestopping Penetrations in Fire-Rated Wall/Floor Assemblies:
   1. Provide proper sizing when providing sleeves or core-drilled holes to accommodate penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet requirements of ASTM E814.

3.08 PRIMER PIPING

A. Excavation and Backfill:
   1. See 3.01 B. above.

B. Drainage, Waste and Vent Piping: Test in accordance with governing plumbing code or as follows: Test drainage and venting systems, with necessary openings plugged, to permit system to be filled with water and subjected to water pressure of minimum of 5 PSI head. System to hold water without water level drop greater than 1/2 pipe diameter of largest nominal pipe size within 24-hour period. Test system in sections if minimum head cannot be maintained in each section. 5 PSI head to be minimum pressure at highest joint.

3.09 CLEANOUTS

A. Install in aboveground piping and building drain piping as indicated, as required by code; at each change in direction of piping greater than 135 degrees; at minimum intervals of 100-feet; and at base of each vertical soil or waste stack. Install floor and wall cleanout covers for concealed piping. Select type to match adjacent building finish. Provide shop drawings to Architect to coordinate locations and types of cleanouts with Architect prior to installation.

B. Drainage, Waste and Vent Piping: Test in accordance with governing plumbing code or as follows: Test drainage and venting systems, with necessary openings plugged, to permit system to be filled with water and subjected to water pressure of minimum of 5 PSI head. System to hold water without water level drop greater than 1/2 pipe diameter of largest nominal pipe size within 24-hour period. Test system in sections if minimum head cannot be maintained in each section. 5 PSI head to be minimum pressure at highest joint.

C. Corrosive Soil Conditions:
   1. Wrap steel, iron, copper or other metal piping materials/fittings with Protecto Wrap 200, 30 mils or greater. Maintain a 1/2-inch overlap and install per manufacturer's requirements.
   2. Provide epoxy coated cast iron pipe and fittings for drainage systems.

D. Cast-Iron Joints: Comply with coupling manufacturer's Cast Iron Soil Pipe Institute Standards and installation instructions.

END OF SECTION

SECTION 22 30 00 - PLUMBING EQUIPMENT

(Issued by Addendum No. 1)

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Emergency Stop Pushbutton Switch
   2. Commercial High Efficiency Storage Type Gas Water Heaters
   3. Electric Domestic Water Heating System
   4. Elevator Simplex Sump Pump System
   5. Grease Interceptors
   6. Exterior Grease Interceptor - Large Capacity
   7. Grease Interceptors - Prefabricated HDPE
   8. Acid Neutralization Tanks - Central System

1.02 RELATED SECTIONS

A. Contents of Division 22, Plumbing and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 22 00 00, Plumbing Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 22 00 00, Plumbing Basic Requirements and Division 01, General Requirements.

B. In addition, provide:
   1. Seismic anchor details and calculations signed and stamped by licensed Oregon structural engineer with equipment data.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 22 00 00, Plumbing Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. NSF 61, Annex G compliant.

C. Products approved for installation by state authorizing agency, no exceptions.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 22 00 00, Plumbing Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Emergency Stop Pushbutton Switch:
   1. Group Schneider/Square D Class 9001 XB5 Family
   2. Eaton
   3. Siemens
   4. General Electric
   5. Or approved equivalent.

B. Commercial High Efficiency Storage Type Gas Water Heaters:
   1. Bradford White Series eF
   2. AO Smith BTH
   3. LAARS UHE
   4. State SUF

5. Or approved equivalent.

C. Electric Domestic Water Heating System:
   1. Hubbell Series SH
   2. Adamson
   3. Bock
   4. Or approved equivalent.

D. Elevator Simplex Sump Pump System - Oil Filled or Air Filled:
   1. Bell and Gossett switch.
   2. Weil
   3. Goulds
   4. Hydromatic
   5. Liberty
   6. Zoeller
   7. Or approved equivalent.

E. Grease Interceptors:
   1. Zurn Series 1171-1170
   2. Thermaco
   3. Rockford
   4. Highland
   5. Smith
   6. Josam
   7. Wade
   8. Watts
   9. Or approved equivalent.

F. Exterior Grease Interceptor - Large Capacity:
   1. Pre-fabricated Concrete Unit:
      a. Jensen Model JPXXXEE-G
      b. Utility Vault
      c. Wieser
      d. Wilkenson Precast
      e. Lar-Ken
      f. Front Range
      g. Shope
      h. Old Castle
      i. Nottingham
      j. Teichert
      k. Or approved equivalent.
   2. Pre-fabricated Steel Unit:
      a. Zurn Z-1172-UN
      b. Josam
      c. Smith
      d. Wade
      e. Watts
      f. Highland
      g. Rockford
      h. Or approved equivalent.

G. Grease Interceptors - Prefabricated HDPE:
   1. Schier Interceptor
   2. Or approved equivalent.

H. Acid Neutralization Tanks - Central System:
   1. Orion
   2. T & C Plastic

3. Ipex
4. Spears
5. George Fisher
6. Ryan Herco
7. Waste Tech
8. Or approved equivalent.

2.02 GENERAL

A. Reference drawings for capacities and specific model numbers.

2.03 EMERGENCY STOP PUSHBUTTON SWITCH

A. Provide 30mm diameter turn-to-release red pushbutton operator with contact blocks to disconnect power to the boiler burner controls and gas service when button is pushed. Contacts are mechanically latching, such that if power is lost and then restored, it is not necessary to manually reset the button to restore gas and power to the boiler. Basis-of-Design: Group Schneider/Square D Class 9001 Family XB series.

2.04 COMMERCIAL HIGH EFFICIENCY STORAGE TYPE GAS WATER HEATERS

A. System: Domestic Hot Water.

B. Provide two gas fired storage high efficiency (98 percent) water heaters with capacities as indicated on Contract Documents. System to deliver minimum 120 degrees F hot water to tenants.

C. Water Heaters in accordance with certified UL volume III tests and most current edition of ASHRAE 90.1. Maximum supply gas pressure to heater 13.8 inches WC (0.5 PSI).

D. Water Heaters factory provided with an CSA (AGA) electronic intermittent gas ignition, gas pressure regulator and pilot filter, coated steel burners, draft diverter and flue damper; 120 volt, 60 Hz, single phase electrical connection.

E. Water Heaters to be insulated with vermin-proof glass fiber insulation, R 16 Value minimum. Outer jacket to have a baked enamel finish over a bonderized undercoating.

F. Internal surfaces of water heaters exposed to water to be glass-lined with alkaline borosilicate, nickelous oxide composition that has been fused to steel by firing at temperature range of 1400 degrees F to 1600 degrees F.

G. Coordinate exact location of units and electrical characteristics with Division 26, Electrical work.

H. Provide seismic anchor calculations for this equipment, stamped and signed by licensed Oregon structural engineer.

I. Warranty: Three year unconditional tank replacement, one year on parts and devices.

2.05 ELECTRIC DOMESTIC WATER HEATING SYSTEM

A. System: Domestic Hot Water

B. Pressure vessel section, including electrical control panel, mounted on structural supports and suitably insulated, jacketed, painted, and provided with lifting lugs. Entire unit is to be packaged ready for plumbing and electrical service connections and bear UL listing mark certifying entire water heater.

C. Pressure vessel welded construction and ASME Code Section IV stamped for working pressure of 125, 100, 150, 160 PSI. Storage vessel carbon steel and lined with seamless Hydrastone cement applied to minimum thickness of 5/8-inch on 100 percent of interior tank surfaces. Phenolic lined steel tank, 3 lb/sq. ft. copper lined steel tank, Hot dipped galvanized steel tank, Flame spray copper steel tank, Solid copper-silicon tank, Solid 90/10 copper-nickel tank, or Solid type 304 or 316L stainless steel tank.

D. Pressure vessel is to be completely covered with 2-inch thick "E" type energy conservation fiberglass blanket insulation and enclosed in heavy gauge galvanized steel metal jacket finished in gray hammertone enamel.

E. Vessel protected by an ASME approved automatic reseating combination temperature and pressure relief valve set at tank working pressure and 210 degrees F.

F. Heater designed to operate with fused low voltage transformer providing 120 volt to operating controls. Immersion heating element(s) high quality copper sheathed Incoloy Type 304 stainless steel Incoloy Type 316 stainless steel and sized to obtain rated recovery. Each element circuit is to be independently operated through definite purpose magnetic contactor having resistive load rating equal to or exceeding ampere rating of that particular circuit and protected by individual power fuses rated at approximately 125 percent of ampacity of circuit. Multiple circuit elements to be provided with master terminal block for connecting of incoming power feeds. Built-in non-fused On/Off disconnect switch. Built-in circuit breaker with On/Off handle. Safety door interlock switch interrupts power to control circuit when control panel door is opened. Control thermostat immersion type and consistent with recovery rate of heating element as to number of steps required. Hi-limit control with manual reset button to be factory installed to disconnect ungrounded conductors to heating element(s) in event of an over-temperature condition in storage section.

G. Water heater manufacturer warranties electrical components against defects in workmanship and material for period of one year from date of start-up, and pressure vessel for full 5 or 10 years non pro-rated from date of start-up, provided that unit is started within three months of date of shipment and installed and operated within scope of tank design and operating capability. Each water heater shipped with complete set of installation and operating instructions including spare parts list and approved drawing.

2.06 ELEVATOR SIMPLEX SUMP PUMP SYSTEM

A. System: Sanitary Sewer.

B. Entire unit is to be delivered complete with operating controls and require only plumbing and electrical service connections.

C. Provide submersible sump pump with 2-inch I.P.S. discharge, bronze fitted construction with submersible sealed motor, stainless steel shaft, bronze impeller, mechanical seal, waterproof 20-foot power cord and fully submersible float switch for mounting on pump discharge pipe.

D. Provide check valve and shut-off valve on discharge side of pump.

E. Provide perforated steel basin cover for sump in elevator pit.

2.07 GREASE INTERCEPTORS

A. Interior and exterior acid resistant coated, steel or stainless steel, grease interceptor, gasketed nonskid locking cover. Cascade bottom. Internal air relief, visible double wall trap, removable baffles. Clamping ring and anchor flange. Grease draw-off piping, flexible hose and valve Zurn Z1108/Z1108-L remote in line, flow control fitting. Provide extension where required by structural features or depth of piping.

B. Interceptor installed flush with finish floor unless specifically directed otherwise by Architect or as detailed on Drawings.

2.08 EXTERIOR GREASE INTERCEPTOR - LARGE CAPACITY

A. Prefabricated Concrete Unit:
   1. Prefabricated reinforced concrete with H-20 traffic load with minimum of 2-feet of soil cover, two compartment, two concrete access risers with 24-inches diameter gas and water tight manhole covers, 4-inch inlet and 4-inch outlet. Unit set on level compacted or undisturbed soil.

B. Prefabricated Steel Unit.
   1. Large capacity acid resistant coated interior and exterior fabricated steel unit with air relief, cleanout plug, double wall trap seal, nonskid cover, flow control fitting, sensor grease level control box. Unit level on crete pit. Reference detail on construction drawings.

2.09 GREASE INTERCEPTORS - PREFABRICATED HDPE

A. Seamless high density polyethylene with built-in flow control constructed and approved for interior or exterior installation.

B. The tank certified by NSF and listed by IAPMO to ASME grease interceptor standard A112.14.3 and rated for on-the-floor or buried applications.

C. Factory installed built-in flow control. Maximum operating temperature 190 degrees F continuous. Integral air relief/anti-siphon.

D. See Drawings for capacities, loading, and similar requirements.

2.10 ACID NEUTRALIZATION TANKS - CENTRAL SYSTEM

A. Polypropylene or polyethylene (HDPE) plastic construction, upright cylindrical type, with approved gas tight gasket and attached cover. Provide openings and connections for inlet, outlet and relief vent. Entire unit to be self-supporting. Materials utilized for tank, cover and accessory fittings and adapters to be compatible with chemicals selected for neutralization treatment. Provide pipe connections per manufacturer's recommendations. Install complete in prefabricated vault assembly.
   1. Neutralizing Fill: Lump limestone or marble in 1- to 3-inch diameter with high calcium carbonate of 85 percent minimum. Full charge of neutralizing fill is to invert of sumps inlet.
   2. Provide Owner with complete manufacturer's instructions for proper maintenance and inspection procedure and schedules. Tank must be maintained with full load of neutralizing media, or serious damage can result to drainage system.
   3. Provide system monitor tank of similar material as neutralization tank with PH probe and control/monitor panel (explosion proof) NEMA 4 rated.
   4. Associated brackets, stands and mounting hardware to be chemical resistant materials (HDPE, PP or stainless steel), as detailed.
   5. Underground installation: Provide precast concrete vault assembly with 44-inches by 56-inches spring loaded hatch, USS series USS-JC44x56. Cover to be rated for general foot traffic.

PART 3 - EXECUTION

3.01 GENERAL

A. Examine areas and conditions under which equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Install equipment in accordance with manufacturer's installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.

C. Orients so controls and devices needing service and maintenance have adequate access.

D. Certificates: Submit appropriate Certificates of Shop Inspection and Data Report as required by provisions of ASME Boiler and Pressure Vessel Code.

E. Connect water piping to units with shutoff valves and unions.

F. Equipment Rigging: Heavy duty rigging eye bolts for Crosby Group swivel hoist rings installed over pump access covers for removal or maintenance.

G. Equipment Start-Up:
   1. Start-up, test, and adjust equipment in accordance with manufacturer's start-up instructions. Check and calibrate controls.
   2. Start-up performed by authorized manufacturer's representative or agent. Provide credentials of start-up personnel to Architect and Owner's Representative for approval.
   3. Remove and replace filters when start-up testing is executed.
   4. Manufacturer adjusts operating parameters of equipment to compensate to elevation of 500-feet above sea level.
   5. Architect, Commissioning Agent, and Owner's Representative will be notified 10 days prior to start-up and will be present at start-ups.

6. Provide written report from manufacturer's representative on results of start-up within 48 hours.
7. Technical Training of maintenance staff includes two hours minimum per each piece of equipment.
8. Seismic Verification:
    a. Contractor will retain structural engineer who will submit stamped and signed anchoring and restraint details on plumbing equipment with submittal data in accordance with Division 22, Plumbing requirements.
    b. Contractor's Structural Engineer will test and verify in writing that seismic restraints have been installed in accordance with their details.

3.02 EMERGENCY STOP PUSHBUTTON SWITCH

A. Boiler/Water Heater/Gas Shutdown:
    1. Provide CSD.1 compliant controls.
    2. Remote switch: Install shutdown switch to disconnect power to the boiler burner controls and gas service in room. Install pushbutton under clear, impact-resistant flip lid. Provide red phenol label "Emergency Shutdown" locate label above pushbutton. Pushbutton to be mounted by latch side of each boiler/mechanical room door within interior of the room, unless otherwise directed by AHJ. Provide electrical wiring and raceway as necessary for installation. Provide additional relays and wiring to cut power to gas solenoid valves in the room not integral to boilers. Reference drawings for gas solenoid valve locations.

3.03 COMMERCIAL HIGH EFFICIENCY STORAGE TYPE GAS WATER HEATERS

A. Examine areas and conditions under which equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Install equipment in accordance with manufacturer's installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.

C. Orients so controls and devices needing service and maintenance have adequate access.

D. Certificates: Submit appropriate Certificates of Shop Inspection and Data Report as required by provisions of ASME Boiler and Pressure Vessel Code.

E. Connect water piping to units with shutoff valves and unions.

F. Equipment Start-Up:
    1. Start-up, test, and adjust equipment in accordance with manufacturer's start-up instructions. Check and calibrate controls.
    2. Start-up performed by authorized manufacturer's representative or agent. Provide credentials of start-up personnel to Architect and Owner's Representative for approval.
    3. Remove and replace filters when start-up testing is executed.
    4. Manufacturer adjusts operating parameters of equipment to compensate to elevation of 500-feet above sea level.
    5. Architect, Commissioning Agent, and Owner's Representative will be notified 10 days prior to start-up and will be present at start-ups.
    6. Provide written report from manufacturer's representative on results of start-up within 48 hours.
    7. Technical Training of maintenance staff includes two hours minimum per each piece of equipment.
    8. Seismic Verification:
        a. Contractor will retain structural engineer who will submit stamped and signed anchoring and restraint details on plumbing equipment with submittal data in accordance with Division 22, Plumbing requirements.
        b. Contractor's Structural Engineer will test and verify in writing that seismic restraints have been installed in accordance with their details.

3.04 ELECTRIC DOMESTIC WATER HEATING SYSTEM

A. Examine areas and conditions under which equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Install equipment in accordance with manufacturer's installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.

C. Orients so controls and devices needing service and maintenance have adequate access.

D. Certificates: Submit appropriate Certificates of Shop Inspection and Data Report as required by provisions of ASME Boiler and Pressure Vessel Code.

E. Connect water piping to units with shutoff valves and unions.

3.05 ELEVATOR SIMPLEX SUMP PUMP SYSTEM

A. Examine areas and conditions under which equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Install equipment in accordance with manufacturer's installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.

C. Orients so controls and devices needing service and maintenance have adequate access.

D. Certificates: Submit appropriate Certificates of Shop Inspection and Data Report as required by provisions of ASME Boiler and Pressure Vessel Code.

E. Connect piping to units with shutoff valves, check valves and unions.

3.06 GREASE INTERCEPTORS

A. Furnish and install per local ordinances/FOG programs and manufacturer's recommendations.

3.07 EXTERIOR GREASE INTERCEPTOR - LARGE CAPACITY

A. Furnish and install per local ordinances/FOG programs and manufacturer's recommendations.

3.08 GREASE INTERCEPTORS - PREFABRICATED HDPE

A. Furnish and install per local ordinances/FOG programs and manufacturer's recommendations.

3.09 ACID NEUTRALIZATION TANKS - CENTRAL SYSTEM

A. Installation:
   1. Examine areas and conditions under which equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been addressed and corrected.
   2. Install equipment in accordance with manufacturer's installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.
   3. Orient components so controls and devices needing service and maintenance have adequate access.
   4. All components and instrumentation for the treatment system shall be furnished, ready for installation from a single system supplier.

B. The neutralization system shall be installed in strict accordance with suppliers/manufacturer’s recommendations and drawings and in compliance with job specifications, local plumbing codes, local and NEC electrical requirements.

C. System calibration and start-up shall be included in the package provided by the manufacturer. The manufacturer shall also be responsible for conducting a training seminar for the site facilities people prior to the system being turned over to the owner. (Minimum 8 hours total).

D. The manufacturer shall supply a complete set of installation drawings in AutoCAD format showing electrical and plumbing schematics.

E. The manufacturer shall provide three sets of complete bound Installation, Operation and Maintenance Manuals, including component maintenance instructions, system drawings, recommended spare parts, and trouble-shooting guide.

F. The system supplier must have a minimum of ten years of experience in the design, manufacture, and installation of pH Neutralization Systems.

G. Reagent chemicals for system start-up shall be included with the system.

H. Charging of the chemical tanks for start-up shall be included as part of the equipment package/start-up.

I. Provide all electrical wiring and raceway as necessary for complete installation. Provide additional relays and wiring to cut power to system. Reference drawings for locations.

END OF SECTION

SECTION 22 40 00
PLUMBING FIXTURES

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. General Plumbing Fixtures:
      a. China Fixtures, White Only
      b. Enameled Steel Fixtures, White Only
      c. Faucet Fittings
      d. Fiberglass Fixtures, White Only
      e. Group Showers
      f. Group Wash Fountain
      g. Hose Reels
      h. Molded Resin or Stone Fixtures
      i. Shower Valves
      j. Stainless Steel Fixtures
      k. Thermostatic Mixing Valves
      l. Trench Drains
   2. Carriers
   3. Downspout Boot/Nozzle/Cover
   4. Drinking Fountains
   5. Electric Water Coolers
   6. Emergency Showers/Eyewash
   7. Fixture Trim
   8. Floor Drains
   9. Floor Sinks
   10. Flushometers - Water Closet/Urinal
   11. Hose Bibbs
   12. Hub Drains
   13. Kitchen Equipment
   14. Roof/Overflow Drains
   15. Water Closet Seats
   16. Drain Boxes
   17. Water Supply Boxes

1.02 RELATED SECTIONS

A. Contents of Division 22, Plumbing and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 22 00 00, Plumbing Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 22 00 00, Plumbing Basic Requirements and Division 01, General Requirements.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 22 00 00, Plumbing Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. Comply with lead free (less than or equal to 0.25 percent) products in drinking water systems.
   2. NSF 61, Annex G, Drinking Water System Components, Compliant.

3. Provide fixtures, faucets and accessories to meet barrier free requirements of the governing code with respect to plumbing fixtures provided for the physically handicapped.
4. Items approved for use by State of Oregon.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 22 00 00, Plumbing Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. "Or approved equivalent" as defined in 22 00 00, Plumbing Basic Requirements. Substitution process requirements apply to approved equivalent products.

B. General Plumbing Fixtures: See Schedule on Drawings for type.
   1. China Fixtures - White Only:
      a. American Standard
      b. Briggs
      c. Crane
      d. Eljer
      e. Kohler
      f. Universal-Rundle
      g. Or approved equivalent.
   2. Enameled Steel Fixtures - White Only:
      a. American Standard
      b. Briggs
      c. Crane
      d. Eljer
      e. Kohler
      f. Universal-Rundle
      g. Or approved equivalent.
   3. Faucet Fittings:
      a. Private:
         1) Chicago
         2) Delta Commercial
         3) Moen
         4) Speakman
         5) Symmons
         6) T&S Brass
         7) Or approved equivalent.
      b. Public:
         1) American Standard
         2) Chicago
         3) Delta Commercial
         4) Moen Commercial
         5) Sloan
         6) Symmons
         7) T & S Brass
         8) Or approved equivalent.
   4. Fiberglass Fixtures - White Only:
      a. Aqua-Glass
      b. Briggs
      c. Crane
      d. Comfort Designs
      e. Hytec
      f. Mustee

g. Universal-Rundle
h. Or approved equivalent.

5. Group Showers:
   a. Acorn
   b. Bradley
   c. Metcraft
   d. Or approved equivalent.
6. Group Wash Fountain:
   a. Acorn
   b. Bradley
   c. Metcraft
   d. Or approved equivalent.
7. Hose Reels:
   a. Balcrank
   b. Lincoln
   c. Or approved equivalent.
8. Molded Resin or Stone Fixtures:
   a. Fiat
   b. Mustee
   c. Stern Williams
   d. Or approved equivalent.
9. Shower Valves:
   a. Acorn
   b. Chicago
   c. Delta
   d. Moen
   e. Powers
   f. Symmons
   g. Or approved equivalent.
10. Stainless Steel Fixtures:
    a. Elkay
    b. Haws
    c. Just
    d. Or approved equivalent.
11. Thermostatic Mixing Valves:
    a. Bradley
    b. Powers
    c. Symmons
    d. Holby
    e. Or approved equivalent.
12. Trench Drains:
    a. Channel-Slope
    b. JR Smith
    c. PolyDrain
    d. Polycast
    e. Quazite
    f. Zurn
    g. Or approved equivalent.

C. Carriers:
   1. JR Smith
   2. Zurn
   3. Or approved equivalent.

D. Downspout Boot/Nozzle/Cover:
   1. JR Smith
   2. Mifab
   3. Sioux Chief
   4. Zurn
   5. Or approved equivalent.

E. Drinking Fountain:
   1. Elkay
   2. Halsey-Taylor
   3. Haws
   4. Oasis
   5. Sunroc
   6. Or approved equivalent.

F. Electric Water Coolers:
   1. Elkay
   2. Halsey-Taylor
   3. Haws
   4. Oasis
   5. Sunroc
   6. Or approved equivalent.

G. Emergency Showers/Eyewash:
   1. Bradley
   2. Encon
   3. Guardian
   4. Haws
   5. Speakman
   6. Or approved equivalent.

H. Fixture Trim:
   1. McGuire
   2. Dearborn Brass
   3. Oatey
   4. Or approved equivalent.

I. Floor Drains:
   1. Mifab
   2. Sioux Chief
   3. Smith
   4. Wade
   5. Watts
   6. Zurn

J. Floor Sinks:
   1. Commercial Enameling
   2. Mifab
   3. Sioux Chief
   4. Smith
   5. Wade
   6. Watts
   7. Zurn
   8. Or approved equivalent.

K. Flushometers - Water Closet/Urinal:
   1. Delaney
   2. Sloan
   3. Zurn

4. Or approved equivalent.

L. Hose Bibbs:
1. Chicago
2. JR Smith
3. Mifab
4. Wade
5. Woodford
6. Zurn
7. Or approved equivalent.

M. Hub Drains:
1. JR Smith
2. Zurn
3. Or approved equivalent.

N. Kitchen Equipment:
1. No products specified. See Part 3 "Kitchen Equipment" article below for additional information.

O. Roof/Overflow Drains:
1. JR Smith
2. Mifab
3. Sioux Chief
4. Watts
5. Zurn
6. Or approved equivalent.

P. Water Closet Seats:
1. Bemis
2. Or approved equivalent.

Q. Drain Boxes:
1. Sioux Chief
2. Or approved equivalent.

R. Water Supply Boxes:
1. Sioux Chief
2. Or approved equivalent.

2.02 GENERAL PLUMBING FIXTURES

A. Review substitution request requirements in Division 01, General Requirements and 22 00 00, Plumbing General Requirements.

B. Reference Architectural Details for mounting height and location of fixtures.

C. Provide factory fabricated fixtures of type, style and material indicated on the plumbing fixture connection schedule shown on the Drawings. For each type fixture, provide fixture manufacturer's standard trim, carrier, seats, and valves as indicated by their published product information; either as designed and constructed, or as recommended by manufacturer, or required for complete installation. Where more than one type is indicated, selection is installer's option; but, fixtures of same type must be furnished by a single manufacturer. Where type is not otherwise indicated, provide fixtures complying with governing regulations.

D. Provide fixtures complete with fittings, supports, fastening devices, bolt caps, faucets, valves, traps, stops and appurtenances.

E. Plumbing Fixture Flow Rates:
1. Water Closets: Single flush at 1.28 GPF.
2. Lavatories in public core areas to be set for a maximum of 0.5 GPM flow. Other lavatories to be 1.0 GPM flow.
3. Sinks to be set for a maximum of 1.5 GPM flow.

4. Showers factory set at a maximum of 1.8 - 2 GPM flow.

F. Plumbing Fixture Thermostatic Mixing Valves:
1. Lavatories provide ASSE 1070 compliant mixing valves or multiple lavatories served by a single ASSE 1070 compliant mixing valve.
2. Sinks serviced with a single ASSE 1070 mixing valve or multiple sinks served by a single ASSE 1070 mixing valve.
3. Commercial kitchen handsinks provide ASSE 1070 mixing valves.
4. Janitor sinks or process/maintenance type sinks do not require ASSE 1070 mixing valves if operated by trained personnel. Provide signage per Section 22 05 53, Identification for Plumbing Piping and Equipment.
5. Hot water hose bibbs do not require ASSE 1070 mixing valves if operated by trained personnel. Provide signage per Section 22 05 53, Identification for Plumbing Piping and Equipment.

2.03 CARRIERS

A. Wall Hung Water Closets:
1. Vertical: Zurn Z-1204-N4-XH-50 or Z-1204-ND4-XH-50 (JR Smith 230y-MS4-M12/230DY-M54-M12). Adjustable vertical load siphon jet with 300 lb. capacity.
2. Horizontal: Zurn ZE-1203-N4-XH-50 or ZE-1203-ND4-XH-50 (JR Smith 220 R/L-Y-M54-M12/220DY-M5-M12). Adjustable horizontal siphon jet with 300 lb. load capacity.

B. Wall Hung Urinal: Zurn Z-1218-WS. (JR Smith 913). Coupling type or plate type with bearing plate 300 lb. capacity.

C. Wall Hung Lavatory: Zurn Z-1231 (D). (JR Smith 700). Concealed arm or Plate type, 250 lb. capactiy.

D. Wall Hung Service Sink: Zurn Z-1218. (JR Smith 913/914). Coupling type.

E. Wall Hung Drinking Fountain: Z-1225-BL (JR Smith 834-97-98). Plate type.

2.04 DOWNSPOUT BOOT/NOZZLE/COVER

A. See Schedule on Drawings for type.

2.05 DRINKING FOUNTAINS

A. See Schedule on Drawings for type.

2.06 ELECTRIC WATER COOLERS

A. See Schedule on Drawings for Type.

2.07 EMERGENCY SHOWERS/EYEWASH

A. Provide emergency showers/eyewash products that are compliant with ANSI Z358.1, Standards for Emergency Eyewashes and Shower Equipment.

2.08 FIXTURE TRIM

A. Traps: Provide heavy duty commercial grade traps on fixtures except fixtures with integral traps. Exposed traps will be chromium plated cast brass or 17 gauge chromium plated brass tubing.
1. Sink: McGuire 8912-C-DF.
2. Lavatory: McGuire 8902-C-DF.

B. Supplies and Stops: Lead free heavy duty commercial grade, chrome plated with brass stems. Stops: T-handle or Loose Key type.
1. Lavatory: McGuire LFH 2165 CK
2. Sink: McGuire LFH 2167 LK
3. Water Closets: McGuire

C. Lavatory Grid Strainer: McGuire 155A.

D. Sink Grid Strainer: McGuire 152N.

E. Shower Grid Strainer: McGuire 1266.

F. Sink Basket Strainer: McGuire 151.

G. Trim barrier-free wrap for P-traps and supplies by McGuire, Pro-Wrap, Plumberex or True-bro.

H. Escutcheons: McGuire wrought brass deep bell.

I. Wax Rings and Toilet Bolts: WM Harvey No Seep No. 1 053065-N.

2.09 FLOOR DRAINS

A. See Schedule on Drawings for types.

2.10 FLOOR SINKS

A. See Schedule on Drawings for types.

B. Plastic components are not allowed.

2.11 FLUSHOMETERS - WATER CLOSET/URINAL

A. See Schedule on Drawings for types.

2.12 HOSE BIBBS

A. See Schedule on Drawings for types.

2.13 HUB DRAINS

A. See Schedule on Drawings for type.

2.14 KITCHEN EQUIPMENT

A. No products specified. See Part 3 "Kitchen Equipment" article below for additional information.

2.15 ROOF/OVERFLOW DRAINS

A. See Schedule on Drawings for type.

B. Plastic components are not allowed.

2.16 WATER CLOSET SEATS

A. See Schedule on Drawings for type.

2.17 DRAIN BOXES

A. See Schedule on Drawings for Type.

B. Provide fire rated ASTM E-84 rated boxes where required by building construction.

2.18 WATER SUPPLY BOXES

A. See Schedule on Drawings for Type.

B. Provide fire rated ASTM E-84 rated boxes where required by building construction.

PART 3 - EXECUTION

3.01 GENERAL PLUMBING FIXTURE INSTALLATION INFORMATION

A. Verification of Conditions:

1. Examine rough-in work of water supply and waste piping systems to verify actual locations of piping connections prior to installing fixtures. Examine floors and substrates, and conditions under which fixture work is to be accomplished. Correct any incorrect locations of piping and other unsatisfactory conditions for installation of plumbing fixtures.
2. Examine walls, floors and cabinets for suitable conditions where fixtures are to be installed.
3. Install plumbing fixtures level and plumb, in accordance with fixture manufacturer's written instructions, rough-in drawings and pertinent codes and regulations, design and referenced standards.
4. Fasten plumbing fixtures securely to supports or building structure. Secure supplies behind or within wall construction to provide rigid installation.
5. Install a stop valve in a readily accessible location in water connection to each fixture.
6. Install escutcheons at each wall, floor and ceiling penetration in exposed finished locations and within cabinets and millwork.

7. Seal fixtures to walls and floors using silicone sealant Dow Corning No. 780 or approved equivalent. Match sealant color to fixture color.
8. Test fixtures to demonstrate proper operation upon completion of installation and after units are water pressurized. Replace malfunctioning units, then retest.
9. Inspect each unit for damage prior to installation. Replace damaged fixtures.
10. Replace washers or cartridges of leaking or dripping faucets and stops.
11. Clean fixtures, trim and strainers using manufacturer's recommended cleaning methods and materials.
12. During construction, cover installed fixtures, drains, sinks and water coolers with cardboard and wrap with sheet plastic.
13. Provide trap primers for floor drains, floor sinks, trench drains and hub drains.
14. Install roof and overflow roof drains per architectural details. Cover drains during roof construction to protect drain. Provide offsets or expansion joints at each roof/overflow drain.
15. Do not use lead flashing.

B. Owner Furnished Equipment:
1. Rough-in and make final connections to Owner furnished equipment. Provide necessary items to complete installation.
2. Comply with requirements of this Section and Drawings for installation procedures.

C. Adjusting and Cleaning: Clean plumbing fixtures, trim, and strainers of dirt and debris upon completion of installation. Adjust water pressure at drinking fountains, faucets, shower valves and flush valves to provide proper flow stream and specified GPM. Repair leaks at faucets and stops.

D. Extra Stock: Furnish special wrenches and other devices necessary for servicing plumbing fixtures and trim to Owner.

E. Field Quality Control: Upon completion of installation of plumbing fixtures, test fixtures to demonstrate capability and compliance with Specifications. Correct or replace malfunctioning units at site, then retest to demonstrate compliance.

F. Protection: Protect fixtures and equipment from damage. Cover finished fixtures with cardboard and sheet plastic. Fixtures are not to be used during construction. Replace damaged items with new.

G. Signage: For fixtures that do not have ASSE 1070 mixing valve protection for hot water temperature, provide signage per Section 22 05 53, Identification for Plumbing Piping and Equipment.

3.02 CARRIERS INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid.

C. Coordinate wall thickness so carrier has adequate depth to be concealed.

3.03 DOWNSPOUT BOOT/NOZZLE/COVER INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid.

3.04 DRINKING FOUNTAIN INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid.

3.05 ELECTRIC WATER COOLER INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid.

3.06 EMERGENCY SHOWERS/EYEWASH INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid.

3.07 FIXTURE TRIM INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid.

3.08 FLOOR DRAINS INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid.

3.09 FLOOR SINK INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid. Set fixture rim/grate flush with surrounding finish surface unless specifically noted otherwise.

3.10 FLUSHOMETERS - WATER CLOSET/URINAL INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid. Set fixture rim/grate flush with surrounding finish surface unless specifically noted otherwise.

3.11 HOSE BIBB INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid.

3.12 HUB DRAINS INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid.

3.13 KITCHEN EQUIPMENT INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Furnish and install shutoff valves, pressure regulators, shock arrestors, vacuum breakers, strainers, indirect waste piping, backflow preventers, and other devices or piping which are not furnished with kitchen equipment or shown on Drawings.

C. Set plumb, level and rigid.

3.14 ROOF/OVERFLOW DRAINS INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid.

3.15 WATER CLOSET SEAT INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid.

3.16 DRAIN BOX INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid.

3.17 WATER SUPPLY BOX INSTALLATION

A. Install components in accordance with manufacturer's instructions and approved product data submittals.

B. Set plumb, level and rigid.

END OF SECTION

SECTION 26 00 00
ELECTRICAL BASIC REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Work included in 26 00 00, Electrical Basic Requirements applies to Division 26, Electrical work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of electrical systems for proposed project.

B. Contract Documents include, but are not limited to, Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Drawings, Addenda, Owner/Architect Agreement, and Owner/Contractor Agreement. Confirm requirements before commencement of work.

C. Definitions:
   1. Provide: To furnish and install, complete and ready for intended use.
   2. Furnish: Supply and deliver to project site, ready for unpacking, assembly and installation.
   3. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at project site as required to complete items of work furnished.
   4. Approved or Approved Equivalent: To possess the same performance qualities and characteristics and fulfill the utilitarian function without any decrease in quality, durability or longevity. For equipment/products defined by the Contractor as "equivalent", substitution requests must be submitted to Engineer for consideration, in accordance with Division 01, General Requirements, and approved by the Engineer prior to submitting bids for substituted items.
   5. Authority Having Jurisdiction (AHJ): Indicates reviewing authorities, including local fire marshal, Owner's insurance underwriter, Owner's representative, and other reviewing entity whose approval is required to obtain systems acceptance.

1.02 RELATED SECTIONS

A. Contents of Section applies to Division 26, Electrical Contract Documents.

B. Related Work:
   1. Additional conditions apply to this Division including, but not limited to:
      a. Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.
      b. Drawings
      c. Addenda
      d. Owner/Architect Agreement
      e. Owner/Contractor Agreement
      f. Codes, Standards, Public Ordinances and Permits

1.03 REFERENCES AND STANDARDS

A. References and Standards per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, individual Division 26, Electrical Sections and those listed in this Section.

B. Codes to include latest adopted editions, including current amendments, supplements and local jurisdiction requirements in effect as of the date of the Contract Documents, of/from:
   1. State of Oregon:
      a. OAR - Oregon Administrative Rules
      b. OESC - Oregon Electrical Specialty Code
      c. OFC - Oregon Fire Code
      d. OMSC - Oregon Mechanical Specialty Code
      e. OPSC - Oregon Plumbing Specialty Code
      f. OSSC - Oregon Structural Specialty Code

g. OEESC - Oregon Energy Efficiency Specialty Code
h. Oregon Elevator Specialty Code

C. Reference standards and guidelines include but are not limited to the latest adopted editions from:
1. ABA - Architectural Barriers Act
2. ADA - Americans with Disabilities Act
3. ANSI - American National Standards Institute
4. APWA - American Public Works Association
5. ASCE - American Society of Civil Engineers
6. ASHRAE Guideline 0, the Commissioning Process
7. ASTM - ASTM International
8. CFR - Code of Federal Regulations
9. EPA - Environmental Protection Agency
10. ETL - Electrical Testing Laboratories
11. FCC - Federal Communications Commission
12. FM - FM Global
13. IBC - International Building Code
14. IEC - International Electrotechnical Commission
15. IEEE - Institute of Electrical and Electronics Engineers
16. IES - Illuminating Engineering Society
17. ISO - International Organization for Standardization
18. MSS - Manufacturers Standardization Society
19. NEC - National Electric Code
20. NECA - National Electrical Contractors Association
21. NEMA - National Electrical Manufacturers Association
22. NETA - National Electrical Testing Association
23. NFPA - National Fire Protection Association
24. OSHA - Occupational Safety and Health Administration
25. UL - Underwriters Laboratories Inc.

D. See Division 26, Electrical individual Sections for additional references.

E. Where code requirements are at variance with Contract Documents, meet code requirements as a minimum requirement and include costs necessary to meet these in Contract. Machinery and equipment are to comply with OSHA requirements, as currently revised and interpreted for equipment manufacturer requirements. Install equipment provided per manufacturer recommendations.

F. Whenever this Specification calls for material, workmanship, arrangement or construction of higher quality and/or capacity than that required by governing codes, higher quality and/or capacity take precedence.

1.04 SUBMITTALS

A. See Division 01, General Requirements for Submittal Procedures as well as individual Division 26, Electrical Sections.

B. Provide drawings in format and software release equal to the design documents. Drawings to be the same sheet size and scale as the Contract Documents.

C. In addition:
1. "No Exception Taken" constitutes that review is for general conformance with the design concept expressed in the Contract Documents for the limited purpose of checking for conformance with information given. Any action is subject to the requirements of the Contract Documents. Contractor is responsible for the dimensions and quantity and will confirm and correlate at the job site, fabrication processes and techniques of construction, coordination of the work with that of all other trades, and the satisfactory performance of the work.

2. Provide product submittals and shop drawings in electronic format only. Electronic format must be submitted via zip file via e-mail. For electronic format, provide one zip file per specification division containing a separate file for each Specification Section. Individual submittals sent piecemeal in a per Specification Section method will be returned without review or comment. All transmissions/submissions to be submitted to Architect. Deviations will be returned without review.
3. Product Data: Provide manufacturer's descriptive literature for products specified in Division 26, Electrical Sections.
4. Identify/mark each submittal in detail. Note what differences, if any, exist between the submitted item and the specified item. Failure to identify the differences will be considered cause for disapproval. If differences are not identified and/or not discovered during the submittal review process, Contractor remains responsible for providing equipment and materials that meet the specifications and drawings.
    a. Label submittal to match numbering/references as shown in Contract Documents. Highlight and label applicable information to individual equipment or cross out/remove extraneous data not applicable to submitted model. Clearly note options and accessories to be provided, including field installed items. Highlight connections by/to other trades.
    b. Include technical data, installation instructions and dimensioned drawings for products, fixtures, equipment and devices installed, furnished or provided. Reference individual Division 26, Electrical specification Sections for specific items required in product data submittal outside of these requirements.
    c. See Division 26, Electrical individual Sections for additional submittal requirements outside of these requirements.
5. Maximum of two reviews of complete submittal package. Arrange for additional reviews and/or early review of long-lead items; Bear costs of these additional reviews at Engineer's hourly rates. Incomplete submittal packages/submittals will be returned to contractor without review.
6. Resubmission Requirements: Make corrections or changes in submittals as required, and in consideration of Engineer’s comments. Identify Engineer’s comments and provide an individual response to each of the Engineer’s comments. Cloud changes in the submittals and further identify changes which are in response to Engineer’s comments.
7. Structural/Seismic: Provide weights, dimensions, mounting requirements and like information required for mounting, seismic bracing, and support. Indicate manufacturer's installation and support requirements to meet ASCE 7-10 requirements for non-structural components. Provide engineered seismic drawings and equipment seismic certification. Equipment Importance Factor as specified in Division 01 and in Structural documents.
8. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required per Division 26, Electrical Coordination Documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 26, Electrical submittals.
9. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.
10. Substitutions and Variation from Basis of Design:
    a. The Basis of Design designated product establishes the qualities and characteristics for the evaluation of any comparable products by other listed acceptable manufacturers if included in this Specification or included in an approved Substitution Request as judged by the Design Professional.
    b. If substitutions and/or equivalent equipment/products are being proposed, it is the responsibility of parties concerned, involved in, and furnishing the substitute and/or equivalent equipment to verify and compare the characteristics and requirements of that furnished to that specified and/or shown. If greater capacity and/or more materials and/or more labor is required for the rough-in, circuitry or connections than for the item specified and provided for, then provide compensation for additional charges required for the proper rough-in, circuitry and connections for the equipment

being furnished. No additional charges above the Base Bid, including resulting charges for work performed under other Divisions, will be allowed for such revisions. Coordinate with the requirements of "Submittals". For any product marked "or approved equivalent", a substitution request must be submitted to Engineer for approval prior to purchase, delivery or installation.

11. Shop Drawings: Provide coordinated shop drawings which include physical characteristics of all systems, device layout plans, and control wiring diagrams. Reference individual Division 26, Electrical specification Sections for additional requirements for shop drawings outside of these requirements.
    a. Provide Shop Drawings indicating access panel locations, size and elevation for approval prior to installation.
12. Samples: Provide samples when requested by individual Sections.
13. Resubmission Requirements:
    a. Make any corrections or change in submittals when required. Provide submittals as specified. The engineer will not be required to edit and/or interpret the Contractor's submittals. Indicate changes for the resubmittal in a cover letter with reference to page(s) changed and reference response to comment. Cloud changes in the submittals.
    b. Resubmit for review until review indicates no exception taken or "make corrections as noted".
14. Operation and Maintenance Manuals, Owners Instructions:
    a. Submit, at one time, electronic files (PDF format) on CD/DVD of manufacturer's operation and maintenance instruction manuals and parts lists for equipment or items requiring servicing. Submit data when work is substantially complete and in same order format as submittals. Include name and location of source parts and service for each piece of equipment.
        1) Include copy of approved submittal data along with submittal review letters received from Engineer. Data to clearly indicate installed equipment model numbers. Delete or cross out data pertaining to other equipment not specific to this project.
        2) Include copy of manufacturer's standard Operations and Maintenance for equipment. At front of each tab, provide routine maintenance documentation for scheduled equipment. Include manufacturer's recommended maintenance schedule and highlight maintenance required to maintain warranty. Furnish list of routine maintenance parts, including part numbers, sizes, quantities, relevant to each piece of equipment.
        3) Include Warranty per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.
        4) Include product certificates of warranties and guarantees.
        5) Include copy of complete parts list for equipment. Include available exploded views of assemblies and sub assemblies.
        6) Include commissioning reports.
        7) Include copy of startup and test reports specific to each piece of equipment.
        8) Engineer will return incomplete documentation without review. Engineer will provide one set of review comments in Submittal Review format. Contractor must arrange for additional reviews; Contractor to bear costs for additional reviews at Engineer's hourly rates.
    b. Thoroughly instruct Owner in proper operation of equipment and systems. Where noted in individual Sections, training will include classroom instruction with applicable training aids and systems demonstrations. Field instruction per Section 26 00 00, Electrical Basic Requirements, Demonstration.
    c. Copies of certificates of code authority inspections, acceptance, code required acceptance tests, letter of conformance and other special guarantees, certificates of warranties, specified elsewhere or indicated on Drawings.

15. Record Drawings:
    a. Maintain at site at least one set of drawings for recording “As-constructed” conditions. Indicate on drawings changes to original documents by referencing revision document, and include buried elements, location of conduit, and location of concealed electrical items. Include items changed by field orders, supplemental instructions, and constructed conditions.
    b. Record Drawings are to include equipment and fixture/connection schedules that accurately reflect "as constructed or installed" for project.
    c. At completion of project, input changes to original project on CAD Drawings or Revit Model and make one set of black-line drawings created from CAD Files or Revit Model in version/release equal to contract drawings. Submit CAD or Revit disk and drawings upon substantial completion.
    d. See Division 26, Electrical individual Sections for additional items to include in record drawings.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements: Work and materials installed to conform with all local, State and Federal codes, and other applicable laws and regulations.

B. Drawings are intended to be diagrammatic and reflect the Basis of Design manufacturer's equipment. They are not intended to show every item in its exact dimensions, or details of equipment or proposed systems layout. Verify actual dimensions of systems (i.e. distribution equipment, duct banks, light fixtures, etc.) and equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than Basis of Design, including, but not limited to, architectural, structural, electrical, HVAC, fire sprinkler, and plumbing systems.

C. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect, in writing, before starting work.

D. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.

E. Provide products that are UL listed.

1.06 WARRANTY

A. Provide written warranty covering the work for a period of one year from date of Substantial Completion in accordance with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.

B. Sections under this Division can require additional and/or extended warranties that apply beyond basic warranty under Division 01, General Requirements and the General Conditions. Confirm requirements in all Contract Documents.

1.07 COORDINATION DOCUMENTS

A. Prepare and submit coordinated layout drawings (composite drawings), prior to construction, to coordinate installation and location of HVAC equipment, ductwork, grilles, diffusers, piping, plumbing equipment/fixtures, fire sprinklers, plumbing, lights, cable tray and electrical services with architectural and structural requirements, and other trades (including plumbing, fire protection, electrical, ceiling suspension, and tile systems), and provide maintenance access requirements. Coordinate with submitted architectural systems (i.e roofing, ceiling, finishes) and structural systems as submitted, including footings and foundation. Identify zone of influence from footings and ensure systems are not routed within the zone of influence. Unless otherwise required by Division 00, Procurement and Contracting Requirements or Division 01, General Requirements, Division 23, HVAC to combine information furnished by other trades into master coordination documents.

B. Prepare Drawings as follows:
   1. Drawings in CAD Format or Revit Model. CAD format or Revit Model release equal to design documents. Drawings to be same sheet size and scale as Contract Drawings and indicate location, size and elevation above finished floor of equipment and distribution systems.
   2. Review and revise, as necessary, section cuts in Contract Drawings after verification of field conditions.
   3. Incorporate Addenda items and change orders.
   4. Provide additional coordination as requested by other trades.

C. Advise Architect in event conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.

D. Verify in field exact size, location, and clearances regarding existing material, equipment and apparatus, and advise Architect of discrepancies between that indicated on Drawings and that existing in field prior to installation related thereto.

E. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Provide like items from one manufacturer.

2.02 MATERIALS

A. Base contract upon furnishing materials as specified. Materials, equipment, and fixtures used for construction are to be new, latest products as listed in manufacturer's printed catalog data and are to be UL approved or have adequate approval or be acceptable by state, county, and city authorities. Equipment/fixture supplier is responsible for obtaining State, County, and City acceptance on equipment/fixtures that are not UL approved or are not listed for installation.

B. Articles, fixtures, and equipment of a kind to be standard product of one manufacturer.

C. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.

D. Hazardous Materials:
   1. Comply with local, State of Oregon, and Federal regulations relating to hazardous materials.
   2. Comply with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements for this project relating to hazardous materials.
   3. Do not use any materials containing a hazardous substance. If hazardous materials are encountered, do not disturb; immediately notify Owner and Architect. Hazardous materials will be removed by Owner under separate contract.

2.03 ACCESS PANELS

A. See Division 01, General Requirements and Division 08, Openings for products and installation requirements.

B. Confirm Access Panel requirements in Division 01, General Requirements, Division 08, Openings and individual Division 26, Electrical Sections. In the absence of specific requirements, comply with the following:
   1. Provide flush mounting access panels for service of systems and individual components requiring maintenance or inspection. Where access panels are located in fire-rated assemblies of building, rate access panels accordingly.
      a. Ceiling access panels to be minimum of 24-inch by 24-inch.
      b. Wall access panels to be minimum of 12-inch by 12-inch.
      c. Provide screwdriver operated catch.
      d. Manufacturers and Models:
         1) Drywall: Karp KDW.
         2) Plaster: Karp DSC-214PL.

3) Masonry: Karp DSC-214M.
4) 2 hour rated: Karp KPF-350FR.
5) Manufacturers: Milcor, Elmdor, Acudor, or approved equivalent.

PART 3 - EXECUTION

3.01 ACCESSIBILITY AND INSTALLATION

A. Confirm Accessibility and Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.

B. Install equipment requiring access (i.e., junction boxes, light fixtures, power supplies, motors, etc.) so that they may be serviced, reset, replaced or recalibrated by service people with normal service tools and equipment. Do not install equipment in passageways, doorways, scuttles or crawlspaces which would impede or block the intended usage.

C. Install equipment and products complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of equipment and examine instructions thoroughly. When requirements of installation instructions conflict with Contract Documents, request clarification from Architect prior to proceeding with installation. This includes proper installation methods, sequencing, and coordination with other trades and disciplines.

D. Earthwork:
   1. Confirm Earthwork requirements in Contract Documents. In the absence of specific requirements, comply with individual Division 26, Electrical Sections and the following:
      a. Perform excavation, dewatering, shoring, bedding, and backfill required for installation of work in this Division in accordance with related earthwork Sections. Contact utilities and locate existing utilities prior to excavation. Repair any work damaged during excavation or backfilling.
      b. Excavation: Do not excavate under footings, foundation bases, or retaining walls.
      c. Provide protection of underground systems. Review the project Geotechnical Report for references to corrosive or deleterious soils which will reduce the performance or service life of underground systems materials.

E. Firestopping:
   1. Confirm requirements in Division 07, Thermal and Moisture Protection. In the absence of specific requirements, comply with individual Division 26, Electrical Sections and the following:
      a. Coordinate location and protection level of fire and/or smoke rated walls, ceilings, and floors. When these assemblies are penetrated, seal around piping and equipment with approved firestopping material. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM E814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops.

F. Plenums:
   1. In plenums, provide plenum rated materials that meet the requirements to be installed in plenums. Immediately notify Architect/Engineer of discrepancy.

G. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

H. Provide miscellaneous supports/metals required for installation of equipment and conduit.

3.02 SEISMIC CONTROL

A. Confirm Seismic Control requirements in Division 01, General Requirements, Structural documents, and individual Division 26 Electrical Sections.

B. General:
   1. Earthquake resistant designs for Electrical (Division 26) equipment and distribution, i.e. power distribution equipment, generators, UPS, etc. to conform to regulations of jurisdiction having authority.
   2. Restraints which are used to prevent disruption of function of piece of equipment because of application of horizontal force to be such that forces are carried to frame of structure in such a way that frame will not be deflected when apparatus is attached to a mounting base and equipment pad, or to structure in normal way, utilizing attachments provided. Secure equipment and distribution systems to withstand a force in direction equal to value defined by jurisdiction having authority.
   3. Provide stamped shop drawings from licensed Structural Engineer of seismic bracing and seismic movement assemblies for conduit and equipment. Submit shop drawings along with equipment submittals.
   4. Provide stamped shop drawings from licensed Structural Engineer of seismic flexible joints for conduit crossing building expansion or seismic joints. Submit shop drawings along with seismic bracing details.
   5. Provide means to prohibit excessive motion of electrical equipment during earthquake.

3.03 REVIEW AND OBSERVATION

A. Confirm Review and Observation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.

B. Notify Architect, in writing, at following stages of construction so that they may, at their option, visit site for review and construction observation:
   1. Underground conduit installation prior to backfilling.
   2. Prior to covering walls.
   3. Prior to ceiling cover/installation.
   4. When main systems, or portions of, are being tested and ready for inspection by AHJ.

C. Final Punch:
   1. Prior to requesting a final punch visit from the Engineer, request from Engineer the Electrical Precloseout Checklist, complete the checklist confirming completion of systems' installation, and return to Engineer. Request a final punch visit from the Engineer, upon Engineer's acceptance that the electrical systems are ready for final punch.
   2. Costs incurred by additional trips required due to incomplete systems will be the responsibility of the Contractor.

3.04 CONTINUITY OF SERVICE

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In the absence of specific requirements in Division 01, General Requirements, comply with individual Division 26, Electrical Sections and the following:
   1. During remodeling or addition to existing structure, while existing structure is occupied, present services to remain intact until new construction, facilities or equipment is installed.
   2. Prior to changing over to new service, verify that every item is thoroughly prepared. Install new wiring, and wiring to point of connection.
   3. Coordinate transfer time to new service with Owner. If required, perform transfer during off-peak hours. Once changeover is started, pursue to its completion to keep interference to a minimum.
      a. If overtime is necessary, there will be no allowance made by Owner for extra expense for such overtime or shift work.
   4. No interruption of services to any part of existing facilities will be permitted without express permission in each instance from Owner. Requests for outages must state specific dates, hours and maximum durations, with outages kept to these specific dates, hours and maximum durations. Obtain written permission from Owner for any interruption of power, lighting or signal circuits and systems.
      a. Organize work to minimize duration of power interruption.

b. Coordinate utility service outages with utility company.

3.05 CUTTING AND PATCHING

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In the absence of specific requirements in Division 01, General Requirements, comply with individual Division 26, Electrical Sections and the following:
   1. Proposed floor cutting/core drilling/sleeve locations to be approved by Project Structural Engineer. Submit proposed locations to Architect/Project Structural Engineer. Where slabs are of post tension construction, perform x-ray scan of proposed penetration locations and submit scan results including proposed penetration locations to Project Structural Engineer/Architect for approval. Where slabs are of waffle type construction, show column cap extent and cell locations relative to proposed penetration(s).
   2. Cutting, patching and repairing for work specified in this Division including plastering, masonry work, concrete work, carpentry work, and painting included under this Section will be performed by skilled craftsmen of each respective trade in conformance with appropriate Division of Work.
   3. Additional openings required in building construction to be made by drilling or cutting. Use of jack hammer is specifically prohibited. Patch openings in and through concrete and masonry with grout.
   4. Restore new or existing work that is cut and/or damaged to original condition. Patch and repair specifically where existing items have been removed. This includes repairing and painting walls, ceilings, etc. where existing conduit and devices are removed as part of this project. Where alterations disturb lawns, paving, and/or walks, surfaces to be repaired, refinished and left in condition matching existing prior to commencement of work.
   5. Additional work required by lack of proper coordination will be provided at no additional cost to the Owner.

3.06 EQUIPMENT SELECTION AND SERVICEABILITY

A. Replace or reposition equipment which is too large or located incorrectly to permit servicing, at no additional cost to Owner.

3.07 DELIVERY, STORAGE AND HANDLING

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In the absence of specific requirements, comply with individual Division 26, Electrical Sections and the following:
   1. Handle materials delivered to project site with care to avoid damage. Store materials on site inside building or protected from weather, dirt and construction dust. Products and/or materials that become damaged due to water, dirt, and/or dust as a result of improper storage and handling to be replaced before installation.
   2. Protect equipment to avoid damage. Close conduit openings with caps or plugs. Keep motors and bearings in watertight and dustproof covers during entire course of installation.
   3. Protect bus duct and similar items until in service.

3.08 DEMONSTRATION

A. Confirm Demonstration requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 26, Electrical Sections.

B. Upon completion of work and adjustment of equipment, test systems and demonstrate to Owner's Representative, Architect, and Engineer that equipment furnished and installed or connected under provisions of these Specifications functions in manner required. Provide field instruction to Owner's Maintenance Staff as specified in Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.

C. Manufacturer's Field Services: Furnish services of a qualified person at time approved by Owner, to instruct maintenance personnel, correct defects or deficiencies, and demonstrate to satisfaction of Owner that entire system is operating in satisfactory manner and complies with

requirements of other trades that may be required to complete work. Complete instruction and demonstration prior to final job site observations.

3.09 CLEANING

A. Confirm Cleaning requirements in Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.

B. Upon completion of installation, thoroughly clean electrical equipment, removing dirt, debris, dust, temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated during work.

3.10 INSTALLATION

A. Confirm Installation requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.

B. Install equipment and fixtures in accordance with manufacturer's installation instructions, plumb and level and firmly anchored to vibration isolators. Maintain manufacturer's recommended clearances.

C. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

D. Provide miscellaneous supports/metals required for installation of equipment.

3.11 PAINTING

A. Confirm requirements in Division 01, General Requirements and Division 09, Finishes. In the absence of specific requirements, comply with individual Division 26, Electrical Sections and the following:
   1. Ferrous Metal: After completion of work, thoroughly clean and paint exposed supports constructed of ferrous metal surfaces (i.e., hangers, hanger rods, equipment stands, etc.) with one coat of black asphalt varnish for exterior or black enamel for interior, suitable for hot surfaces.
   2. In Electrical Room, on roof or other exposed areas, equipment not painted with enamel to receive two coats of primer and one coat of rustproof enamel, colors as selected by Architect.
   3. See individual equipment Specifications for other painting.
   4. Structural Steel: Repair damage to structural steel finishes or finishes of other materials damaged by cutting, welding or patching to match original.
   5. Conduit: Clean, primer coat and paint interior/exterior conduit exposed in public areas with two coats paint suitable for metallic surfaces. Color selected by Architect.
   6. Covers: Covers such as manholes, vaults and the like will be furnished with finishes which resist corrosion and rust.

3.12 ACCESS PANELS

A. Confirm Access Panel requirements in Division 01, General Requirements. In the absence of specific requirements in Division 01, General Requirements, comply with individual Division 26, Electrical Sections and the following:
   1. Coordinate locations/sizes of access panels with Architect prior to work.

3.13 ACCEPTANCE

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In the absence of specific requirements, comply with individual Division 26, Electrical Sections and the following:
   1. System cannot be considered for acceptance until work is completed and demonstrated to Architect that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
      a. Cleaning
      b. Operation and Maintenance Manuals

c. Training of Operating Personnel
d. Record Drawings
e. Warranty and Guaranty Certificates
f. Start-up/Test Document and Commissioning Reports

3.14 FIELD QUALITY CONTROL

A. Confirm Field Quality Control requirements in Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.

B. Tests:
1. Conduct tests of equipment and systems to demonstrate compliance with requirements specified. Reference individual Specification Sections for required tests. Document tests and include in operation and maintenance manuals.
2. During site evaluations by Architect or Engineer, provide appropriate personnel with tools to remove and replace trims, covers, and devices so that proper evaluation of installation can be performed.

3.15 LETTER OF CONFORMANCE

A. Provide Letter of Conformance, copies of manufacturers' warranties and extended warranties with a statement that Electrical items were installed in accordance with manufacturer's recommendations, UL listings and FM Global approvals. Include Letter of Conformance, copies of manufacturers' warranties and extended warranties in Operation and Maintenance Manuals.

END OF SECTION

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Grounding Electrodes
   2. Connectors and Accessories
   3. Grounding Busbar
   4. Grounding Conductor

1.02 RELATED SECTIONS

A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, provide:
   1. Test reports of ground resistance for service and separately derived system grounds.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. Comply with the requirements of ANSI/NFPA 70.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Grounding Electrodes:
   1. Erico
   2. Thomas & Betts
   3. Talley
   4. Or approved equivalent.

B. Connectors and Accessories:
   1. Burndy Hyground Compression System
   2. Erico/Cadweld
   3. Amp Ampact Grounding System
   4. Pipe Grounding Clamp:
      a. Burndy GAR Series
      b. O Z Gedney
      c. Thomas & Betts
      d. Or approved equivalent.

C. Grounding Busbar:
   1. Chatsworth
   2. Erico
   3. Schneider Electric/Square D

4. Panduit
5. Or approved equivalent.

D. Grounding Conductor
1. General Cable
2. Okonite
3. Southwire
4. Or approved equivalent

2.02 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel, minimum 3/4-inch diameter, 10-feet long, tapered point, chamfered top.

2.03 CONNECTORS AND ACCESSORIES

A. Grounding Connectors: Hydraulic compression tool applied connectors or exothermic welding process connectors or powder actuated compression tool applied connectors.

B. Pipe Grounding Clamp: Mechanical ground connector with cable parallel or perpendicular to pipe.

2.04 GROUNDING BUSBAR

A. Grounding Busbar: 1/4-inch thick by 4-inch high by 20-inch long copper grounding busbar with insulators that meet ANSI J-STD-607-A specifications. UL 467 listed. Hole patterns in busbar to accommodate two-hole lugs, four-hole configuration.

2.05 GROUNDING CONDUCTOR

A. Grounding Electrode Conductor: Soft-draw bare stranded copper for wire sizes larger than #10 AWG Bare. Solid copper for wire sizes #10 AWG and smaller.

B. Equipment Grounding Conductor: Green insulated, insulation type to match that of associated feeder or branch circuit wiring, size as indicated on drawings.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Verify site conditions prior to beginning work.

B. Bond Sections of service equipment enclosure to service ground bus.

C. Separately Derived Systems: Ground each separately derived system per NEC Article 250.

D. Corrosion inhibitors: Apply a corrosion inhibitor to contact surfaces when making grounding and bonding connections. Use corrosion inhibitor appropriate for protecting a connection between metals used.

E. Grounding system resistance to ground not to exceed 5 ohms. Make necessary modifications or additions to grounding electrode system for compliance. Submit final tests to assure that this requirement is met.

F. Resistance of grounding electrode system: measure using a four-terminal fall-of-potential method as defined in IEEE 81. Take ground resistance measurements before electrical distribution system is energized and in normally dry conditions, not less than 48 hours after last rainfall. Take resistance measurements of separate grounding electrode systems before systems are bonded together below grade. Combined resistance of separate systems may be used to meet required resistance, but specified number of electrodes must still be provided.

G. Inspect and test in accordance with NETA Standard ATS, Except Section 4.

H. Perform inspections and tests listed in NETA Standard AB, Section 7.13.

3.02 GROUNDING ELECTRODES INSTALLATION

A. Concrete-Encased Electrode (“Ufer Ground”):
1. From service equipment ground bus provide grounding electrode conductor to footing/foundation rebar.

2. Bond #4 grounding electrode conductor to one minimum 20-foot long, 3/4-inch diameter independent steel rebar(s).
3. Protect grounding electrode conductor from footing/foundation to service equipment grounding bus with rigid PVC conduit where grounding electrode conductor passes through concrete floor or other concrete structure. Do not use rigid metal conduit for grounding electrode conductor protection.
4. Coordinate bonding of rebar in base of building concrete footing with installer prior to placement of concrete.

B. Ground Rod Electrode:
1. Verify that final backfill and compaction have been completed before driving rod electrodes.
2. Bond #6 grounding electrode conductor to driven ground rods as indicated on Drawings.
3. Tap at center ground rod and extend grounding electrode conductor to service grounding bus. Install grounding electrode conductor to service grounding bus in rigid PVC conduit for physical protection where grounding electrode conductor passes through concrete floor or other concrete structure.

C. Metal Underground Water Service: Bond water service pipe to service equipment ground bus or to the grounding electrode system. Connect to water pipe on utility side of isolating fittings or meters, bond across water meters.

D. Other Metal Piping Systems: Bond gas piping system, fire sprinkler piping system and other metal piping systems to service equipment ground bus or to the grounding electrode system.

E. Bond together metal siding not attached to grounded structure; bond to grounding electrode system.

3.03 CONNECTORS AND ACCESSORIES INSTALLATION

A. Install per manufacturer's instructions.

3.04 GROUNDING BUSBAR INSTALLATION

A. Install per manufacturer's instructions.

3.05 GROUNDING CONDUCTOR INSTALLATION

A. Raceways:
1. Ground metallic raceway systems. Bond to ground terminal with code size jumper except where code size or larger equipment grounding conductor is included with circuit, use grounding bushing with lay-in lug.
2. Connect metal raceways, which terminate within an enclosure but without mechanical connection to enclosure, by grounding bushings and ground conductor to grounding bus.
3. Where equipment supply conductors are in flexible metallic conduit, install stranded copper equipment grounding conductor from outlet box to equipment frame.
4. Install equipment grounding conductor, code size minimum unless noted on drawings, in metallic and nonmetallic raceway systems.

B. Feeders and Branch Circuits:
1. Provide continuous green insulated copper equipment grounding conductors for feeders and branch circuits.
2. Where installed in a continuous solid metallic raceway system and larger sizes are not detailed, provide insulated equipment grounding conductors for feeders and branch circuits sized in accordance with the latest adopted edition of NEC Article 250, Table 250-122.

C. Bond boxes, cabinets, enclosures and panelboard equipment grounding conductors to enclosure with specified conductors and lugs. Install lugs only on thoroughly cleaned contact surfaces.

D. Motors, Equipment and Appliances: Install code size equipment grounding conductor to (motor) equipment frame or manufacturer's designated ground terminal.

E. Receptacles: Connect ground terminal of receptacle and associated outlet box to equipment grounding conductor. Self grounding nature of receptacle devices does not eliminate equipment grounding conductor bolted to outlet box.

END OF SECTION

SECTION 26 05 33
RACEWAYS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Rigid Metal Conduit (RMC)
   2. Intermediate Metal Conduit (IMC)
   3. Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Metal Conduit
   4. Electrical Metallic Tubing (EMT)
   5. Flexible Metal Conduit (FMC)
   6. Liquidtight Flexible Metal Conduit (LFMC)
   7. Electrical Polyvinyl Chloride (PVC) Conduit
   8. Conduit Fittings
   9. Surface Raceway Systems

B. Provide a complete system of conduit and fittings, with associated couplings, connectors, and fittings, as shown on drawings and described in these specifications.

1.02 RELATED SECTIONS

A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

B. In addition, reference the following:
   1. Section 26 05 29, Hangers and Supports for Electrical Systems and Equipment
   2. Section 26 05 34, Boxes
   3. Section 26 05 43, Electrical Vaults and Underground Raceways

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.07 DEFINITIONS

A. Raceway system is defined as consisting of conduit, tubing, duct, and fittings including but not limited to connectors, couplings, offsets, elbows, bushings, expansion/deflection fittings, and other components and accessories. Complete electrical raceway installation before starting the installation of conductors and cables.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Rigid Metal Conduit (RMC):
   1. Allied Tube & Conduit
   2. Beck Manufacturing Inc.
   3. Picoma
   4. Wheatland Tube Company
   5. Or approved equivalent.

B. Intermediate Metal Conduit (IMC):
   1. Allied Tube & Conduit
   2. Beck Manufacturing WL
   3. Picoma
   4. Wheatland Tube Company
   5. Or approved equivalent.

C. Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit:
   1. Allied Tube & Conduit
   2. Thomas & Betts Corporation
   3. Robroy Industries
   4. O'kote Inc.
   5. Or approved equivalent.

D. Electrical Metallic Tubing (EMT):
   1. Allied Tube & Conduit
   2. Beck Manufacturing WL
   3. Picoma
   4. Wheatland Tube Company
   5. Or approved equivalent.

E. Flexible Metal Conduit (FMC):
   1. AFC Cable Systems Inc.
   2. Electri-Flex Company
   3. International Metal Hose
   4. Or approved equivalent.

F. Liquidtight Flexible Metal Conduit (LFMC):
   1. AFC Cable Systems Inc.
   2. Electri-Flex Company
   3. International Metal Hose
   4. Or approved equivalent.

G. Electrical Polyvinyl Chloride (PVC) Conduit:
   1. AFC Cable Systems Inc.
   2. Electri-Flex Company
   3. International Metal Hose
   4. JM Eagle
   5. Or approved equivalent.

H. Conduit Fittings:
   1. Bushings:
      a. Insulated Type for Threaded Raceway Without Factory Installed Plastic Throat Conductor Protection:
         1) Thomas & Betts 1222 Series
         2) O-Z Gedney B Series
         3) Or approved Equivalent.
   2. Raceway Connectors and Couplings:
      a. Thomas & Betts Series
      b. O-Z Gedney Series
      c. Or approved Equivalent.
   3. Expansion/Deflection Fittings:
      a. EMT: O-Z Gedney Type TX
      b. RMC: O-Z Gedney Type AX, DX and AXDX, Crouse & Hinds XD
      c. PVC: O-Z Gedney Type DX with PVC adapters, Carlon E945 Series, Kraloy OPEJ Series
      d. Or approved equivalent.

I. Surface Raceway Systems:
   1. Single Channel Surface Raceway and Signal:
      a. Legrand (Wiremold) AL3300 Series
      b. MonoSystems SWA 3200 Series
      c. Or approved equivalent.
   2. Two Channel Surface Raceway:
      a. Legrand (Wiremold) ALDS4000 Series
      b. MonoSystems SWA 4500 Series
      c. Or approved equivalent.

2.02 RIGID METAL CONDUIT (RMC)

A. UL 6, ANSI C80.1. Hot dipped galvanized steel conduit after thread cutting.
   1. Fittings: NEMA FB2.10.

2.03 INTERMEDIATE METAL CONDUIT (IMC)

A. UL6, ANSI C80.6. Hot dipped galvanized after thread cutting.
   1. Fittings: NEMA FB2.10.

2.04 POLYVINYL CHLORIDE (PVC) EXTERNALLY COATED GALVANIZED RIGID METAL CONDUIT

A. Description: UL 6, ANSI C80.1, and NEMA RN 1; rigid steel conduit with external PVC coating.
   1. PVC Coating: Minimum 40 mils in thickness.

B. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.

2.05 ELECTRICAL METALLIC TUBING (EMT)

A. Description: UL 797, ANSI C80.3; steel galvanized tubing.

B. Fittings: NEMA FB 1; steel, compression type.

2.06 FLEXIBLE METAL CONDUIT (FMC)

A. Description: UL 1, Interlocked steel construction.

B. Fittings: NEMA FB 2.20.

2.07 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Description: UL 360, inner core made from spiral wound strip of heavy gauge, hot dipped galvanized low carbon steel. 3/4-inch through 1-1/4-inch trade sizes to have a square lock core and contain an integral bonding strip of copper. 1-1/2-inch and larger to have fully interlocked core. Jacket material to be moisture, oil and sunlight resistant flexible PVC.

B. Fittings: NEMA FB 2.20.

2.08 ELECTRICAL POLYVINYL CHLORIDE (PVC) CONDUIT

A. Description: UL 651, NEMA TC 2; Schedule 40 PVC.

B. Fittings: NEMA TC 3.

2.09 CONDUIT FITTINGS

A. Bushings:
   1. Insulated type for threaded raceway connectors without factory-installed plastic throat conductor protection.
   2. Insulated grounding type for threaded raceway connectors.

B. Raceway Connectors and Couplings:
   1. Steel connectors, couplings, and conduit bodies, hot-dip galvanized.
   2. Connector locknuts to be steel, with threads meeting ASTM tolerances. Locknuts to be hot-dip galvanized.
   3. Connector throats (EMT, flexible conduit, metal clad cable and cordset connectors) to have factory installed plastic inserts permanently installed. For normal cable or conductor exiting angles from raceway, the cable jacket or conductor insulation to bear only on plastic throat insert.

4. Steel gland, Tomic or Breagle connectors and couplings are recognized for this Contract as having acceptable raceway to fitting electrical conductance.
5. Set screw connectors and couplings, without integral compression glands, are recognized for this Contract as not having acceptable raceway to fitting electrical conductance. A ground conductor sized per this Specification must be included and bonded within raceway assembly utilizing this type connector or coupling.

C. Provide expansion/deflection fittings for EMT.

2.10 SURFACE RACEWAY SYSTEMS

A. Single Channel Surface Raceway:
1. Power: Provide 20 amp multi-outlet assembly as indicated on drawings.
2. Signal: Blank cover with outlets as indicated on drawings.

B. Two Channel Surface Raceway: One channel for power, other channel for signal. Provide 20 amp multi-outlet assembly as indicated on drawings. Provide divider between channels.

C. Provide lengths scaled from drawings to tolerance of 1/2-inch, over raceway length, between end wall surface. Do not scale from Division 26, Electrical Drawings.

D. Provide prewired receptacles every 24-inches unless otherwise noted on drawings. Reference Section 26 27 26, Wiring Devices for device requirements.

E. Provide end caps, corner joints, tees, transition fittings, device brackets and like items for complete installation.

F. Verify exact mounting height with drawings.

G. Finish Brushed Aluminum.

H. Basis of Design: Surface raceway design, shown on the drawings, is based on Legrand (Wiremold) product line. Approved manufacturers listed are allowed on condition of meeting the specified conditions including area of fill, finish and coordination with other trades. Remove and replace raceway not meeting these conditions at no cost to Owner.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Finished Surfaces: Schedule raceway installation to avoid conflict with installed wall and ceiling surfaces. If unavoidable, coordinate work and repairs with Architect.

B. Conduit Size:
1. Minimum Size: 3/4-inch for power and control, unless otherwise noted. 3/4-inch for communication/data, unless otherwise noted. 3/4-inch for signal systems, unless otherwise noted.

C. Underground Installations:
1. More than 5-feet from Foundation Wall: Use PVC.
2. Within 5-feet from Foundation Wall: Use PVC coated RMC.
3. In or Under Slab on Grade: Use PVC.
4. Minimum Size: 1-inch.

D. In Slab Above Grade:
1. Use PVC.
2. Maximum Size Conduit in Slab: Contact Structural Engineer for maximum outside diameter of conduit.

E. Provide two pull strings/tapes in empty conduits. Types:
1. Utility Company Conduit: Polyester measure/pulling tape, Greenlee 4436 or approved equivalent. Coordinate exact requirements with utility company.
2. Feeders: Polyester measure/pulling tape, Greenlee 4436 or approved.
3. Branch Circuits and Low Voltage: Greenlee Poly Line 431 or approved.
4. If fish tape is used for pulling line or low voltage wiring, fiberglass type to be used. Metal fish tapes will not be allowed.

5. Secure pull string/tape at each end.
6. Provide caps on ends of empty conduit to be used in future.
7. Label both ends of empty conduits with location of opposite end.

F. Elbows: Use fiberglass or PVC coated RMC for underground installations.

G. Elbow for Low Energy Signal Systems: Use long radius factory ells where linking sections of raceway for installation of signal cable.

H. Elbow for Medium Voltage Systems: Use long radius factory ells where linking sections of raceway per NEC Article 300.34.

I. Verify that field measurements are as shown on drawings.

J. Plan locations of conduit runs in advance of the installation and coordinate with ductwork, plumbing, ceiling and wall construction in the same areas.

K. Locate penetrations and holes in advance where they are proposed in the structural sections such as footings, beams, and walls. Penetrations are acceptable only when the following occurs:
1. Where shown on the structural drawings.
2. As approved by the Structural Engineer prior to construction, and after submittal of drawing showing location, size, and position of each penetration.

L. Verify routing and termination locations of conduit prior to rough-in.

M. Conduit routing is shown on drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

N. Install raceways securely, in neat and workmanlike manner, as specified in NECA 1, Standard Practices for Good Workmanship in Electrical Construction.

O. Install steel conduit as specified in NECA 101, Standard for Installing Steel Conduits.

P. Install nonmetallic conduit in accordance with manufacturer's instructions.

Q. Inserts, anchors and sleeves.
1. Coordinate location of inserts and anchor bolts for electrical systems prior to concrete pour.
2. Coordinate location of sleeves with consideration for other building systems prior to concrete pour.

R. Conduit Supports:
1. Arrange supports to prevent misalignment during wiring installation.
2. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
3. Group related conduits; support using conduit rack. Construct rack using steel channel. Provide space on each for 25 percent additional conduits.
4. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
5. Do not attach conduit to ceiling support wires.

S. Flexible steel conduit length not-to-exceed 6-feet, 3-feet in concealed walls. Provide sufficient slack to reduce the effect of vibration.

T. Install conduit seals at boundaries where ambient temperatures differ by 10 degrees F or more as shown on the drawings. Install seals on warm side of partition.

U. Seal raceways stubbing up into electrical equipment. Plug raceways with conductors with duct-seal. Cap spare raceways and plug PVC raceway products with plastic plugs as made by Underground Products, or equal, shaped to fit snugly into the stubup.

V. Seal raceways penetrating an exterior building wall to prevent moisture and vermin from entering into the electrical equipment.

W. Use suitable caps on spare and empty conduits to protect installed conduit against entrance of dirt and moisture.

X. Only conduit servicing elevator equipment can be installed through elevator shafts or equipment rooms. These conduits may only enter the room and go directly to the equipment being supplied.

Y. Keep 277/480 volt wiring independent of 120/208 volt wiring. Keep power wiring independent of communication system wiring.

Z. Keep emergency system wiring independent of other wiring systems per NEC 700.

AA. Installation of conduit in structural concrete that is less than 3-inches thick is prohibited without the approval of the Structural Engineer. Maintenance pads, and curbs are exempted.

AB. Raceways Embedded in Floor Slabs:
1. Do not install raceways in slab without the approval of the Structural Engineer.
2. Do not let raceways interfere with placement of floor slab reinforcement components.
3. Install raceways between the upper and the lower layers of reinforcing steel.
4. Space raceways not less than 8-inches on centers except where they converge at panels or junction boxes.
5. Raceways running parallel to slabs supports, such as beams, columns and structural walls, to be installed not less than 12-inches from such supporting elements.
6. Branch circuit homeruns are not permitted in slab, route branch circuit homeruns above grade exposed in approved areas or above lay-in ceiling spaces.
7. Route conduits in or under slabs point-to-point.
8. Do not cross conduits in slab.
9. Encase medium voltage feeder conduits using red concrete.

AC. Arrange conduit to maintain headroom and present neat appearance.

AD. Do not install conduits on surface of building exterior, along vapor barrier, across roof, on top of parapet walls, or across floors, unless otherwise noted on drawings.

AE. Exposed conduits are permitted only in following areas:
1. Mechanical rooms, electrical rooms or spaces where walls, ceilings and floors will not be covered with finished material.
2. Existing walls that are concrete or block construction.
3. Where specifically noted on Drawings.
4. Route exposed conduit parallel and perpendicular to walls, tight to finished surfaces and neatly offset into boxes.

AF. Do not install conduits or other electrical equipment in obvious passages, doorways, scuttles or crawl spaces which would impede or block area passage's intended usage.

AG. Install continuous conduit and raceways for electrical power wiring and signal systems wiring.

AH. Below Grade Conduit:
1. See 26 05 43, Electrical Vaults and Underground Raceways.
2. Use PVC, PVC coated RMC, or fiberglass conduit.
3. Provide watertight conduit sleeves and rubber seals for conduit entering building below grade, Link-Seal system by Thunderline Corporation or approved equivalent.

AI. Route conduit installed above accessible ceilings parallel and perpendicular to walls.

AJ. Maintain adequate clearance between conduit and piping.

AK. Keep conduits a minimum of 12-inches away from steam or hot water radiant heating lines (at or above 104 degrees F) or 3-inches away from waste or water lines.

AL. Cut conduit square using saw or pipecutter; deburr cut ends.

AM. Bring conduit to shoulder of fittings; fasten securely.

AN. Use conduit hubs to fasten conduit to cast boxes in damp and wet locations.

AO. Install no more than the equivalent of three 90 degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams.

AP. Use hydraulic one shot bender to fabricate elbows for bends in metal conduit larger than 2-inch size.

AQ. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.

AR. Provide suitable fittings to accommodate expansion and deflection where conduit crosses seismic, control, and expansion joints.

AS. Conduit Terminations for Signal Systems: Provide a plastic bushing on the end of conduit used for signal system wiring.

AT. Feeders: Do not combine or change feeder runs.

AU. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Division 07, Thermal and Moisture Protection.

AV. Route conduit through roof openings for piping and ductwork wherever possible. Where separate roofing penetration is required, coordinate location and installation method with roofing installation and installer.

3.02 RIGID METAL CONDUIT (RMC) INSTALLATION

A. Outdoor Locations Above Grade: RMC.

B. In areas exposed to mechanical damage: RMC.

C. For security conduits installed exposed and subject to tampering: RMC.

3.03 INTERMEDIATE METAL CONDUIT (IMC) INSTALLATION

A. Damp Locations: IMC.

3.04 POLYVINYL CHLORIDE (PVC) EXTERNALLY COATED GALVANIZED RIGID METAL CONDUIT INSTALLATION

A. Use PVC coated RMC 36-inch radius ells for power service conduits and 48-inch radius ells for telephone service conduits.

3.05 ELECTRICAL METALLIC TUBING (EMT) INSTALLATION

A. Damp Locations: EMT up to 2-inches in diameter with compression couplings.

B. Dry Locations:
   1. Concealed: EMT.
   2. Exposed: EMT.

C. Dry, Protected: EMT.

3.06 FLEXIBLE METAL CONDUIT (FMC) INSTALLATION

A. Dry Locations: Motors, recessed luminaires and equipment connections subject to movement or vibration, use flexible metallic conduit.

B. Install 12-inch minimum slack loop on flexible metallic conduit.

3.07 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC) INSTALLATION

A. Use PVC coated liquidtight flexible metallic conduit for motors and equipment connections subject to movement or vibration and subjected to any of following conditions: Exterior location, moist or humid atmosphere, corrosive environments, water spray, oil, or grease.

B. Install 12-inch minimum slack loop on liquidtight flexible metallic conduit.

3.08 ELECTRICAL POLYVINYL CHLORIDE (PVC) CONDUIT INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide equipment grounding conductor in PVC conduit runs containing power conductors.

C. Underground Installation:
   1. Areas subject to vehicular traffic: Schedule 80 PVC.
   2. Emergency System: Schedule 80 PVC.
   3. Utility primary and secondary conduit: Schedule 80 PVC.

4. Other underground applications: Schedule 40 PVC, except where prohibited by the NEC or local codes.

D. Convert PVC conduit to Rigid Metal Conduit (RMC) prior to emerging from underground, concrete encasement, or concrete slab.

E. Locations Subject to Corrosive Influences: Schedule 80 PVC where allowed in NEC 300.6 and approved for use by the Authority Having Jurisdiction and also the Architect.

F. Provide expansion fittings to compensate for expansion and contraction per NEC 352.44.

G. PVC elbows are not acceptable. Use fiberglass or PVC coated RMC.

H. Trim cut ends inside and outside to remove rough edges.

I. Provide bushings when entering a box, fitting or other enclosure.

3.09 CONDUIT FITTINGS INSTALLATION

A. Conduit Joints: Assemble conduits continuous and secure to boxes, panels, luminaires and equipment with fittings to maintain continuity. Provide watertight joints where embedded in concrete, below grade or in damp locations. Seal metal conduit with metal thread primer. Rigid conduit connections to be threaded, clean and tight (metal to metal). Threadless connections are not permitted for RMC.

B. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.

C. Use compression fittings in dry locations, damp and rain-exposed locations. Maximum size permitted in damp locations and locations exposed to rain is 2-inches in diameter.

D. Use threaded type fittings in wet locations, hazardous locations, and damp or rain-exposed locations where conduit size is greater than 2-inches.

E. Use PVC coated, threaded type fittings in corrosive environments.

F. Use insulated type bushings with ground provision at switchboards, panelboards, safety disconnect switches, junction boxes that have feeders 60 amperes and greater.

G. Condulets and Conduit Bodies:
1. Do not use condulets and conduit bodies.

H. Sleeves and Chases - Floor, Ceiling and Wall Penetrations: Provide necessary rigid conduit sleeves, openings and chases where conduits or cables are required to pass through floors, ceilings or walls.

I. Expansion Joints:
1. Provide conduits crossing expansion joints where cast in concrete with expansion-deflection fittings, installed per manufacturer's recommendations.
2. Secure conduits 3-inches and larger to building structure on opposite sides of a building expansion joint with an expansion-deflection fitting across joint installed per manufacturer's recommendations.
3. Provide conduits less than 3-inches where not cast in concrete with junction boxes securely fastened on both sides of expansion joint, connected together with 15-inches of slack (minimum of 15-inches longer than straight line length) flexible conduit and copper green ground bonding jumper. In lieu of this flexible conduit, an expansion-deflection fitting, as indicated for conduits 3-inch and larger may be installed.
4. Verify expansion/deflection requirements with Structural Engineer prior to installation.

J. Seismic Joints:
1. No conduits cast in concrete allowed to cross seismic joint.
2. Provide conduits with junction boxes securely fastened on both sides of seismic joint, connected together with 15-inches of slack (minimum of 15-inches longer than straight line length) flexible conduit and copper green ground bonding jumper. Prior to installation, verify with Architect that 15-inches is adequate for designed movement, and if not, increase this length as required.

3. Provide conduits less than 3-inches where not cast in concrete with junction boxes securely fastened on both sides of expansion joint, connected together with 15-inches of slack (minimum of 15-inches longer than straight line length) flexible conduit and copper green ground bonding jumper. In lieu of this flexible conduit, an expansion-deflection fitting, as indicated for conduits 3-inch and larger may be installed.

K. Provide rigid conduit coupling flush with surface of slab or wall for conduit stubbed in concrete slab or wall to serve electrical equipment or an outlet under table or to supply shop tool, etc. Provide plug where conduit is to be used in future.

3.10 SURFACE RACEWAY SYSTEMS INSTALLATION

A. Install per manufacturer's installation instructions, perpendicular and parallel to building lines.

B. Use flat-head screws, clips, and straps to fasten raceway channel to surfaces. Mount plumb and level.

C. Use suitable insulating bushings and inserts at connections to outlets and corner fittings.

D. Close end of wireway and unused conduit openings.

END OF SECTION

SECTION 26 05 34
BOXES

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Outlet Boxes
   2. Floor Boxes and Poke-Thrus
   3. Pull and Junction Boxes
   4. Box Extension Adapter
   5. Weatherproof Outlet Boxes

B. Provide electrical boxes and fittings for a complete installation. Include but not limited to outlet boxes, junction boxes, pull boxes, bushings, locknuts and other necessary components.

1.02 RELATED SECTIONS

A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

B. In addition, reference the following:
   1. Section 26 05 33, Raceways
   2. Section 26 05 53, Identification for Electrical Systems

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Outlet Boxes:
   1. Hubbell
   2. Thomas & Betts
   3. Eaton/Crouse-Hinds
   4. Or approved equivalent.

B. Floor Boxes and Poke-Thrus:
   1. Legrand (Wiremold))
   2. FSR
   3. Hubbell
   4. Thomas & Betts
   5. MonoSystems
   6. Eaton/Crouse-Hinds
   7. Or approved equivalent.

C. Pull and Junction Boxes:
   1. Eaton/Crouse-Hinds
   2. Hoffman

3. Or approved equivalent.

D. Box Extension Adapter:
   1. Hubbell
   2. Thomas & Betts
   3. Eaton/Crouse-Hinds
   4. Or approved equivalent.

E. Weatherproof Outlet Boxes:
   1. Legrand (Pass & Seymour)
   2. Hubbell
   3. Thomas & Betts
   4. Eaton/Crouse-Hinds
   5. Intermatic
   6. Or approved equivalent.

2.02 OUTLET BOXES

A. Luminaire Outlet: 4-inch octagonal box, 1-1/2-inches deep with 3/8-inch luminaire stud if required. Provide raised covers on bracket outlets and on ceiling outlets.

B. Device Outlet: Installation of one or two devices at common location, minimum 4-inches square, minimum 1-1/2-inches deep. Single- or two-gang flush device raised covers.

C. Telecom Outlet: Provide 4-inches square, minimum 2-1/8-inch deep box with two-gang plaster ring.

D. Multiple Devices: Three or more devices at common location. Install one-piece gang boxes with one-piece device cover. Install one device per gang.

E. Masonry Boxes: Outlets in concrete.

F. Construction: For interior locations, provide galvanized steel outlet wiring boxes, of the type, shape and size, including depth of box, to suit each respective location and installation; constructed with stamped knockouts in back and sides, and with threaded holes with screws for securing box covers or wiring devices.

G. Accessories: Provide outlet box accessories for each installation, including mounting brackets, wallboard hangers, extension rings, luminaire studs, cable clamps and metal straps for supporting outlet boxes, compatible with outlet boxes being used and meeting requirements of individual wiring situations.

H. Noise Control: Provide acoustic putty pad to back side of each outlet box installed in acoustic rated walls.

2.03 FLOOR BOXES AND POKE-THRUS

A. Basis of Design: Floor boxes and poke-thrus are based on Legrand/Wiremold as the manufacturer. Manufacturers are approved for use on this project on condition of meeting or exceeding basis of design for conditions of use, box capacity, total allowed connecting conduit capacity, and available finishes. Products ordered or installed not meeting basis of design are subject to removal and replacement at no cost to Owner.

B. Floor Boxes:
   1. Multi-Gang Box, Slab on Grade: Cast iron housing rated for slab on grade application, fully adjustable, accepts up to 2-inch conduits. Rubber gasket protects interior from water and debris. 6-gang. Provide with 3 duplex receptacles and activations for 3 telecom/AV outlets. Rectangular activation, flanged for use with smooth, level finish. Finish: aluminum. Legrand/Wiremold RFB6E-OG or approved.
   2. Multi-Gang Box, Slab above Grade: Steel housing rated for fire rated slab above grade application, fully adjustable, accepts up to 2-inch conduits, fire rated for 3 hours. Rubber gasket protects interior from water and debris. 6-gang. Provide with 3 duplex receptacles and activations for 3 telecom/AV outlets. Rectangular activation, flanged, for use with smooth, level finish. Finish: aluminum Legrand/Wiremold EFB6-FA or approved.

C. Poke-Thrus: Fire rated for up to 2 hr rated floors. Suitable for air handling spaces. Meets ADA accessibility guidelines. Exceeds UL scrub water exclusion requirements for tile, carpet and wood covered floors. Where used, devices recessed below floor level.
   1. Cover Finish: Aluminum.
   2. Poke-thru with devices (including A/V) for 8-inch diameter core hole. Capacity for 4-gangs of power and communications devices. Prewired with two duplex receptacles. Designed to accept Extron Electronics AAP and MAAP Series devices. Basis of Design: Legrand (Wiremold) 8AT series.
   3. Provide the following low voltage device mounting plates:
      a. Decorator Style Basis of Design: Legrand (Wiremold) 6DEC.
      b. Blank Basis of Design: Legrand (Wiremold) 6B.
      c. Any additional accessories.

2.04 PULL AND JUNCTION BOXES

A. Construction: Provide ANSI 49 gray enamel painted sheet steel junction and pull boxes, with screw-on covers; of type shape and size, to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws and washers.

B. Location:
   1. Provide junction boxes above accessible ceilings for drops into walls for receptacle outlets from overhead.
   2. Provide junction boxes and pull boxes to facilitate installation of conductors and limiting accumulated angular sum of bends between boxes, cabinets and appliances to 270 degrees.

C. Fiberglass Handholes: Die molded glass fiber hand holes:
   1. Cable Entrance: Pre-cut 6- x 6-inch cable entrance at center bottom of each side.
   2. Cover: Fiberglass weatherproof cover with nonskid finish.
   3. Cover Legend: ELECTRIC.

2.05 BOX EXTENSION ADAPTER

A. Construction: Diecast aluminum.

B. Location: Install over flush wall outlet boxes to permit flexible raceway extension from flush outlet to fixed or movable equipment.

2.06 WEATHERPROOF OUTLET BOXES

A. Construction: Provide corrosion-resistant cast metal weatherproof outlet wiring boxes, of the type, shape and size, including depth of box, with threaded conduit ends, cast metal faceplate with spring-hinged waterproof cap suitably configured for each application, including faceplate, gasket, blank plugs and corrosion proof fasteners. Weatherproof boxes to be constructed to have smooth sides, gray finish.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Coordinate locations of floor boxes and wall mounted wiring device boxes with architectural and structural floor plans prior to rough-in.

B. Install boxes securely, in a neat and workmanlike manner, as specified in NECA 1, Standard Practice of Good Workmanship in Electrical Construction.

C. Secure boxes rigidly to substrate upon which they are being mounted, or solidly embed boxes in concrete or masonry.

D. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and as required by NEC. Locate boxes and conduit bodies so as to ensure accessibility of electrical wiring.

E. Set wall mounted boxes at elevations to accommodate mounting heights specified in this Section.

F. Electrical boxes are shown on drawings in approximate locations unless dimensioned.
   1. Adjust box locations up to 10-feet if required to accommodate intended purpose.

G. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Division 07, Thermal and Moisture Protection.

H. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

I. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

J. Support boxes independently of conduit, except cast box that is connected to two rigid metal conduits both supported within 12-inches of box.

K. Box Color Coding and Marking: Reference Section 26 05 53, Identification for Electrical Systems.

L. Adjust boxes to be parallel with building lines. Boxes not plumb to building lines are not acceptable.

M. Install knockout closures in unused box openings.

N. Clean interior of boxes to remove dust, debris, and other material.

O. Clean exposed surfaces and restore finish.

3.02 OUTLET BOXES INSTALLATION

A. Mount outlet boxes, unless otherwise required by ADA, or noted on drawings, following distances above finished floor:
   1. Control Switches:
      a. 48-inches to the top of outlet box.
      b. 4-inches above top of backsplash at countertops/workstations, not-to-exceed 44-inches above finished floor to the top of outlet box per ADA requirements.
   2. Receptacles: 15-inches to the bottom of outlet box.
   3. Telecom Outlets: 15-inches to the bottom of outlet box. Coordinate with Division 27, Communications.
   4. Other Outlets: As indicated in other sections of specifications or as detailed on drawings.

B. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6-inches from ceiling access panel or from removable recessed luminaire.

C. Flush Outlets in Insulated Spaces: Maintain integrity of insulation and vapor barrier.

D. Coordinate electrical device locations and elevations (switches and receptacles) with architectural drawings to prevent mounting devices in mirrors, back splashes, and behind cabinets.

E. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan.

F. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices. Adjacent boxes not aligned vertically to be adjusted at no additional cost to Owner.

G. Use flush mounting outlet box in finished areas.

H. Do not install flush mounting box back-to-back in walls; provide minimum 6-inches separation. Provide minimum 24-inches in acoustic rated walls.

I. In acoustical walls, apply acoustic putty pad on outlet box prior to installation of acoustical blanket.

J. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

K. Use stamped steel bridges to fasten flush mounting outlet box between studs.

L. Use adjustable steel channel fasteners for hung ceiling outlet box.

M. Use gang box where more than one device is mounted together. Do not use sectional box.

N. Use gang box with plaster ring for single device outlets.

O. Adjust flush-mounting outlets to make front flush with finished wall material.

3.03 FLOOR BOXES AND POKE-THRUS INSTALLATION

A. Use cast floor boxes for installations in slab on grade; formed steel boxes are acceptable for other installations.

B. Set floor boxes level.

C. Adjust floor boxes flush with finish flooring material.

D. Provide poke-thrus with fire rating equal to floor rating.

E. Provide sufficient concrete cover around floor box to maintain fire rating of floor slab for slab above grade, and meet manufacturer installation directions for floor box on grade.

3.04 PULL AND JUNCTION BOXES INSTALLATION

A. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

B. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6-inches from ceiling access panel or from removable recessed luminaire.

C. Do not fasten boxes to ceiling support wires.

D. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.

3.05 BOX EXTENSION ADAPTER INSTALLATION

A. Match material to box.

B. Install gaskets at exterior and wet locations.

3.06 WEATHERPROOF OUTLET BOXES INSTALLATION

A. Use cast outlet box in exterior locations exposed to weather and wet locations.

B. Install gaskets.

END OF SECTION

SECTION 26 05 43
ELECTRICAL VAULTS AND UNDERGROUND RACEWAYS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Vaults
   2. Vault Covers
   3. Precast Vault Concrete Materials
   4. Vault Components
   5. Handholes
   6. Raceways

1.02 RELATED SECTIONS

A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

B. In addition, reference the following:
   1. Section 26 05 33, Raceways

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit (EPC-40 and EPC-80).
   2. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing.
   3. NEMA TC 6/8 - Extra-Strength PVC Plastic Utilities Duct for Underground Installation.
   4. NEMA TC 9 - Fittings for Extra-Strength Plastic Utilities Duct for Underground Installation.
   5. NEMA TC 14 - Reinforced Thermosetting Resin Conduit (RTRC) and Fittings.
   6. UL 1684 - Standard for Reinforced Thermosetting Resin Conduit (RTRC) and Fittings.

1.04 SUBMITTALS

A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, provide:
   1. Shop drawings detailing items provided under this Section:
      a. Vault cover assigned designators.
      b. Duct entry schedule.
      c. Pulling iron working load.
      d. ASTM load designation and percentage increase in live load for impact.
      e. Vault section weights.
      f. Rebar and piling support details.
      g. Indicate dimensions, reinforcement, size and locations of openings, and accessory locations for precast manholes and handholes.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. Installer will have documented experience in the placement of vaults for a minimum of 3 years.
   2. Manufacturer will have documented experience in the manufacturer of vaults for minimum of three years.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Vaults:
   1. Oldcastle Precast
   2. Or approved equivalent.

B. Vault Covers:
   1. Oldcastle Precast
   2. Jensen Precast
   3. Neenah Foundry
   4. Or approved equivalent.

C. Precast Vault Concrete Materials:
   1. Oldcastle Precast
   2. Jensen Precast
   3. Or approved equivalent.

D. Vault Components:
   1. Pull-In Irons:
      a. Oldcastle Precast
      b. Jensen Precast
      c. Hubbell
      d. Inwesco
      e. Or approved equivalent.
   2. Vault Cable Rack Hardware:
      a. Oldcastle Precast
      b. Jensen Precast
      c. Hubbell/Chance
      d. Or approved equivalent.
   3. Grade Rings:
      a. Oldcastle Precast
      b. Jensen Precast
      c. Neenah Foundry
      d. Or approved equivalent.

E. Handholes:
   1. Oldcastle Precast
   2. Jensen Precast
   3. Hubbell/Quazite
   4. Or approved equivalent.

F. Raceways:
   1. See Section 26 05 33, Raceways.
   2. Fiberglass (RTRC):
      a. FRE Composites Corp.
      b. Champion Fiberglass
      c. United Fiberglass of America

2.02 VAULTS

A. Vaults: Precast, reinforced concrete sections (top, base and where required, extension sections) with knockouts or duct terminators PVC end bells for main conduit entrances with recessed keyways and subsidiary duct entrances.

B. Concrete inserts will be set in interior surfaces of walls of each section to provide for cable rack mounting. Base section will be equipped with pulling-in irons.

2.03 VAULT COVERS

A. Manufactured from metal casting, conforming to ASTM A48-83.

B. Class 35B gray cast iron, with machine finished flat bearing surface.

2.04 PRECAST VAULT CONCRETE MATERIALS

A. Concrete:
1. Conform to ASTM C478.
2. Compressive Strength: 5000-PSI minimum at 28 days.
3. Air Content: 4 percent minimum.
4. Cementitious Materials: Minimum of 564-lbs/cu yd.
5. Course Aggregates: ASTM C33. Sound, crushed, angular granite stone only. Smooth or rounded stone will not be used.
6. Fine Aggregates: ASTM C33. Free from organic impurities.
7. Chemical Admixtures: ASTM C494. Calcium chloride or admixtures containing calcium chloride will not be used.
8. Air Entraining Admixtures: ASTM C260.

B. Reinforcing Steel: ASTM A615 grade 60 deformed bar.

C. Lift Loops:
1. ASTM A416 steel strand.
2. Lifting loops made from deformed bars are not allowed.

D. Flexible Joint Sealants:
1. Butyl rubber based conforming to Federal Specification SS-S-210A, AASHTO-198, Type B-Butyl Rubber and maximum of 1 percent volatile matter.
2. Suitable for application temperatures between 10 and 100 degrees F.

E. Epoxy Gels:
1. Two-component, solvent-free, moisture-insensitive, high modulus, high strength, structural epoxy paste adhesive.
2. Meet requirements of ASTM C-881, Type I and II, Grade 3, Class B and C, epoxy resin adhesive.

2.05 VAULT COMPONENTS

A. Lifting Inserts, Holes and Devices: Comply with OSHA Standard 1926.704. Size lift holes and inserts for precision fit with lift devices and not penetrating through structure wall. Precast manufacturer will provide lifting devices.

B. Internally seal joints between tongue and groove; additionally, seal around external perimeter of the joint as follows:
1. External Seals: Polyethylene backed flat butyl rubber sheet no less than 1/16-inch thick and 6-inches wide applied to outside perimeter of joint.
2. Internal Seals: Plastic or paper-backed butyl rubber rope no less than 14 feet long and having cross-sectional area no less than annular space times height of joint.
3. Contractor Option: Internal seals on round joints may consist of O-ring gasket conforming to ASTM C443, installed according to precast manufacturer's recommendation.

C. Top Section: Include grooved opening for frame and cover.

D. Frames and Covers: ASTM A48; Class 30B gray coast iron. Provide cover marking as indicated on drawings.

E. Precast Base Sections: Cast monolithically without construction joints or with approved galvanized or PVC water stop cast in the cold joint between base slab and walls. Include 3-inch deep by 14-inch round sump with cast sleeve, and two 1-inch ground rod openings.

F. Wall and inside slab finish resulting from casting against forms standard for industry will be acceptable. Form ties through the wall are not allowed. Float finish for exterior slab surfaces

below grade. Small surface holes, normal color variations, normal form joint marks and minor depressions, chips and spalls will be tolerated. Dimensional tolerances will be as set forth in above references.

G. Conduit entry size and locations as indicated on drawings. Conduit openings not to extend into corners of structures, but may extend across joint with Engineer's approval.

H. Knockout panel dimensions as required by structural design at their maximum burial depth using design loads specified below.

I. Design components in accordance with ACI, ASTM C890 and the following loads:
   1. Horizontal Load on Walls and Knockout Panels: 80 psf per foot of burial depth (using a burial depth of 20-feet) plus a live lateral surcharge due to HS20 traffic load of 80 psf.
   2. Vertical Load on Below Grade Adaptor Slabs and Tops: Fill height of 20-feet assuming soil unit weight of 100 lbs/ft, plus live HS20 traffic load.
   3. Vertical Load on Covers Supported Around Perimeter: Live HS20 traffic load.

J. Provide cable racks, mounting channels and inserts as indicated on drawings. Cable Rack Inserts: Minimum load rating of 800 pounds.

K. Cable Supports: Maple clamps and saddles.

L. Sump Cover: ASTM A48; Class 30B gray cast iron.

M. Rectangular sub-grade components to be designed and manufactured in conformance with ASTM C913 and as follows:
   1. Joints Between Precast Components: Keyways or tongue and groove. Joints to Accept Cast Iron Frames: Flat and no less than 5-inches wide.
   2. Construct access vault structures to sizes and elevations shown on Drawings.
   3. Manholes and Hardware:
      a. Provide each manhole with one galvanized 3/4-inch rebar x 16-inches wide bolt-on ladder, mounting pads and mounting hardware. Rungs at 12-inches centers. Side Rails: 2-inches x 5/16-inches flat bar.
      b. Supply each manhole entrance with one galvanized 3/4-inch x 16-inches wide bolt-on manhole step.

N. Pull-In Irons:
   1. 7/8-inch hot-dipped galvanized pull-in irons located opposite each new and future main cable entrance.

O. Vault Cable Rack Hardware:
   1. Cable Rack: Chance #1225
   2. Cable Rack Hooks: Chance #1231
   3. Cable Rack Insulators: Chance #1121

P. Grade Rings:
   1. Rings, Covers and Frames: Class 35 gray iron. Covers and Frames: Equal to Neenah Foundry #R-1530 manhole frame Type B non-rocking lid. As required to meet grading level.

2.06 HANDHOLES

A. Housing: Polyester pre-mix with calcium carbonate and polyester resins interlaced with fiber fiberglass and ultraviolet inhibitors.

B. Extension Rings: Capable of accepting up to 18-inches of extension rings to adapt to re-leveling of grade during construction.

C. Lid: Polyester pre-mix with calcium carbonate and polyester resins interlaced with fiber fiberglass and ultraviolet inhibitors, with nonskid finish, neoprene gaskets and stainless steel screws. Same size as opening of housing for as much hand space as possible for wire access.

D. Lid Legend: ELECTRICAL.

E. Cable Entrance: Pre-cut 6 x 6-inch cable entrance at center bottom of each side.

2.07 RACEWAYS

A. See Section 26 05 33, Raceways.

B. PVC Conduit: NEMA TC 2; Schedule 40. Fittings and Conduit Bodies: NEMA TC 3.

C. Plastic Utilities Duct: NEMA TC 6/8; PVC Type DB.

D. Plastic Utility Duct Fittings: NEMA TC 9.

E. Fiberglass Conduit (RTRC), Elbows and Fittings: NEMA TC 14 and UL 1684.
   1. Conduit and Fittings: 0.095 inches wall thickness.
   2. Large Sweep Elbows: 1.110 inches wall thickness.
   3. Joining Method: Supply each length of conduit with a tapered spigot and an integral bell with an integral urethane Tri-Seal gasket held in place with a retaining ring. Minimum 400 pound for the Tri-Seal joint.
   4. Adapters: Provide appropriate UL Listed adapters for transitions to and from PVC and steel conduit.
   5. Provide conduit in 20 foot lengths, free of burrs and ridges.
   6. Fabricate sweeps in one piece, without couplings, joints or tangent lengths, other than at ends.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Install per manufacturer's instructions and recommendations.

B. Plan locations of duct runs in advance of the installation. Coordinate with site utility systems and building foundation depths.

C. Duct bank routing is shown on drawings in approximate locations unless dimensions are indicated. Verify routing and termination locations of duct bank prior to excavation for rough-in. Route as required to complete duct system.

D. Manhole and vault locations are shown on drawings in approximate locations unless dimensions are indicated. Verify locations of manholes and vaults prior to excavating for installation. Locate as required to complete duct bank system.

E. Requirements for Precast Concrete Vaults: Coordinate delivery of precast concrete manhole components to jobsite with manufacturer. Handle materials in accordance with ASTM C891 and manufacturer's recommendations. Handle and store components on job site using methods that prevent damage.

F. Cleaning Vaults: Clean and leave free of debris, silt and rocks from installation work.

G. Medium Voltage System Raceways: Concrete encased in red slurry as indicated on civil drawings.

3.02 VAULTS

A. Excavate to required depth and remove materials that are unstable or unsuitable for good foundation. Prepare level, compacted foundation extending 6-inches beyond base. Some manholes/vaults may be piling supported. Check structural drawings and details.

B. Set base plumb and level.

C. Provide minimum 18-inches of pea gravel below manhole/vault for stability and drainage.

D. Thoroughly clean bells and spigots to remove dirt and other foreign materials that may prevent sealing. Unroll butyl sealant rope directly against spigot or keyway. Leave protective wrapper attached until sealant is entirely unrolled. Do not stretch. Overlap from side to side, not top to bottom.

E. When recommended by manufacturer, fill void between horizontal joint surfaces with sand cement grout around the outside perimeter.

F. After joining sections, apply butyl sealant sheet around outside perimeter of joint.

G. Plug lift holes leaving less than 2-inches of wall thickness from outside using sand cement mortar, then cover with butyl rubber sheet. Additionally seal lift holes penetrating wall with epoxy gel on interior.

H. Set frames or tops to required elevation sealing joints with butyl sealant rope and sheet.

I. Use precast neck and shaft sections to bring manhole/vault cover to finished elevation.

J. Provide cable racks in each manhole/vault for support of conductors. Attach cable racks to inserts after manhole/vault installation is complete.

K. Install drains in manholes/vaults as indicated on drawings and as required.

L. Provide 3/4-inch by 10-foot copper ground rod at each manhole/vault.

M. Dampproof exterior surfaces, joints, and interruptions of manholes/vaults after concrete has cured 28 days.

3.03 HANDHOLES

A. Excavate to required depth and remove materials that are unstable or unsuitable for good foundation. Prepare level, compacted foundation extending 6-inches beyond base. Some vaults may be piling supported. Check structural drawings and details.

B. Set base plumb and level.

C. Provide minimum 12-inches of pea gravel below handhole for stability and drainage.

D. Turn conduits up into handhold with required bend radius per guidance in 27 05 33, Raceways.

E. Engrave cover of handhole to identify its purpose (examples: “Power," “Emergency Power,” “Signal,” “Fire Alarm”).

3.04 RACEWAYS

A. Power and System Duct Bank Raceways: PVC, Fiberglass (RTRC) or PVC coated Rigid Metal Conduit.

B. Elbows for Power and System Raceways: Fiberglass (RTRC) elbows or PVC coated Rigid Metal Conduit elbows.

C. Provide all excavation and backfill required to support Division 01 and this Division of work. Coordinate trench specs for concrete, soil or sand backfill.

D. Excavate trenches six inches deeper and wider than ductbank burial and cross-sectional requirements. Remove from the site all excavated materials not suitable or specified for backfill.

E. Backfill trenches with sand, tamped firm and even to trench depth level.

F. Backfill with non-expansive soil with limited porosity. Deposit all backfill soil in 6-inch layers. Thoroughly and carefully tamp all backfill soils to 90-95 percent compaction until the ductbank is covered by no less than 12 inches of material. Backfill and tamp the remainder of the excavation at 12-inch intervals. Uniformly grade the finished surface.

G. Provide sheeting, shoring, dewatering and cleaning required to keep the trenches and their grades in proper condition for the work to be carried on.

H. Restore all landscape and paving to like new to match existing.

I. Slope raceways away from buildings and drain towards manholes or vaults with a minimum slope of 3 percent. Drain raceways into manholes or vaults, not into building structures or panels. Where sloping cannot be fully provided and there is a section of raceway where water would flow to a panel, switchboard, transformer, or building, provide a means to discharge the excess water from the raceway, or raceway system, consisting of a box or fitting at a low point prior to equipment entry, or at building entry, with a fitting or plug that can be removed to allow drainage.

J. Cut raceway square using saw or pipe cutter; de-burr cut ends.

K. Insert raceway to shoulder of fittings; fasten securely.

L. Join PVC raceway using adhesive as recommended by manufacturer.

M. Wipe PVC raceway dry and clean before joining. Apply full even coat of adhesive to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.

N. Number of equivalent 90-degree bends permitted between pull points: Maximum of three bends for power system conduit banks.

O. Provide suitable fittings to accommodate expansion and deflection where required.

P. Terminate raceway at manhole entries using end bells.

Q. Use suitable separators and chairs installed not greater than 5 feet on centers.

R. Provide 1/4-inch polypropylene pull rope in each empty raceway except sleeves and nipples.

S. Swab raceway. Use suitable caps to protect installed conduit against entrance of dirt and moisture.

T. Interface installation of underground warning tape with backfilling. Install tape 6 inches below finished surface.

U. Concrete Encased Raceways:
   1. Encasement Concrete: Minimum 2,500 psi mix. Red color additive: Provide concrete mixture ration containing five pounds of red oxide for one yard of concrete.
   2. Securely anchor raceway to prevent movement during concrete placement.
   3. Provide two No. 4 steel reinforcing bars in top of bank under paved areas.
   4. Stagger raceway joints vertically six inches minimum.
   5. Connect to existing concrete encasement using dowels.

END OF SECTION

SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Equipment Nameplates
   2. Device Labels
   3. Wire Markers
   4. Conduit Markers
   5. Underground Warning Tape

1.02 RELATED SECTIONS

A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals not required for this Section.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. Manufacturer's Qualifications: Firms regularly engaged in manufacture of identification devices of types and sizes required.
   2. Manufacturer's standard products of categories and types required for each application as referenced in other Division 26, Electrical Sections. Where more than a single type is specified for application, provide single selection for each product category.
   3. Codes and Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices unless otherwise indicated.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Equipment Nameplates:
   1. B & I Nameplates
   2. Intellicum
   3. JBR Associates
   4. Or approved equivalent.

B. Device Labels:
   1. Kroy
   2. Brady
   3. Or approved equivalent.

C. Wire Markers:
   1. Brady
   2. Panduit
   3. Sumitomo
   4. Or approved equivalent.

D. Conduit Markers:
   1. Allen Systems
   2. Brady
   3. Or approved equivalent.

E. Underground Warning Tape:
   1. Allen Systems
   2. Brady
   3. Or approved equivalent.

2.02 EQUIPMENT NAMEPLATES

A. Engraved phenolic plastic, laminate, minimum 1/8-inch thick in the size indicated, with beveled edge border matching letter color. Federal specification L-P-387. All upper case letters in engraver standard letter style of the size and wording indicated. Punched for mechanical fastening, except where adhesive mounting is necessary due to substrate. Embossed tape style labels are not acceptable.

B. Color:
   1. Normal (Utility): White letters on black background.
   2. Life Safety/Critical (Emergency Systems): Black letters on orange background.
   3. Equipment Branch (Legally Required Standby Systems): Black letters on yellow background.

C. Letter Size:
   1. Use 1/2-inch letters minimum for identifying major equipment and loads, including switchgear, switchboards, etc.
   2. Use 1/2-inch letters minimum for identifying panels, breakers, etc.
   3. Use 3/16-inch minimum for identifying source, voltage, current, phase, and wire configurations.

D. Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.

E. The Architect, Engineer, Commissioning Agent and Owner reserve the right to make modifications to the nameplates as necessary.

F. Access Panel Markers: Manufacturer's standard 1/16-inch thick engraved plastic laminate access panel markers, with abbreviations and numbers corresponding to concealed valve or devices/equipment. Include center hole to allow attachment.

G. Locations:
   1. Switchgear, switchboards, sub-distribution switchboards, distribution panels, and branch panels.
   2. Main breakers and distribution breakers in switchgear, switchboards, and distribution panels.
   3. Equipment including, but not limited to, motor controllers, disconnects, and VFDs.
   4. Low-voltage equipment enclosures including, but not limited to, fire alarm panels, access control panels, and lighting control panels.
   5. Distribution transformers.

2.03 DEVICE LABELS

A. Extra strength, laminated adhesive tape, with 3/16-inch black letters on clear background. Use only for identification of individual wall switches and receptacles. Indicate device name, source panel, and source circuits. Panel and circuit designation written in permanent marker on the back of the plate and inside the back-box. Do not provide punch tape style labels.

B. Label all junction boxes to show system identification, source circuit, or raceway origin. In finished areas, utilize device label. In unfinished areas or above ceilings, use of permanent ink marker is acceptable.

2.04 WIRE MARKERS

A. Description: Vinyl-cloth self-adhesive type wire markers.

B. Locations: Each conductor at panelboard gutters, pull boxes, outlet boxes, junction boxes, and each load connection.

C. Power and Lighting Circuits: Branch circuit or feeder number as indicated on drawings and source panel.

D. Control Circuits: control wire number indicated on schematic and interconnection diagrams on drawings or shop drawings.

2.05 CONDUIT MARKERS

A. Description: Self-sticking vinyl.

B. Location: Furnish markers for each conduit longer than 6-feet.

C. Spacing: 20-feet on center.

D. Color:
   1. 480 Volt System: Black letters on Orange background
   2. 208 Volt System: Black letters on Orange background
   3. Fire Alarm System: Red
   4. Telephone System: Orange

2.06 UNDERGROUND WARNING TAPE

A. Description: 6-inch wide inert polyethylene plastic tape, 4-mil thick, detectable type, colored per APWA recommendations unless otherwise noted with suitable warning legend describing buried electrical lines.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Coordinate designations used on Drawings with equipment nameplates and device labels.

B. Install nameplates and labels parallel to equipment lines.

C. Identify empty conduit and boxes with intended use.

D. Provide typewritten branch panel schedules with protective clear transparent covers accounting for every breaker installed. Use actual room designations assigned by name or number near completion of the work, and not the designations shown on drawings.

E. Provide color coded boxes as follows:
   1. Fire Alarm: Red.

3.02 EQUIPMENT NAMEPLATES

A. Degrease and clean surfaces to receive nameplates.

B. Secure equipment nameplates to equipment front using self-tapping stainless steel screws.

C. Secure equipment nameplates to inside surface of door on panelboard that is recessed in finished locations.

D. Verify emergency system distribution equipment nameplate colors with Architect/Owner.

E. Provide master nameplate at each incoming utility service to identify the following (each on a separate line):
   1. Serving Utility Transformer (ex. Utility Service #1).
   2. Project.
   3. Serving Utility Company.
   4. Consulting Engineering Firm of Record.
   5. Month and Year of Completion.
   6. Voltage, Phase, and Wire Configuration.

F. Switchgear, switchboards, and panels to include name source, voltage, current phase, wire configuration and fault current rating. Transformers to include source KVA, and secondary voltage, phase, and wire configuration.

G. Provide nameplates for flush mounted branch panelboards identifying name on front door. On inside of door provide nameplate as noted above. Verify with Architect/Owner if nameplate on outside of door is required.

H. Provide a second label at branch panelboards listing the means of identification of branch circuit conductors. This identification legend to consist of the color code used for each voltage system (208Y/120V and 480Y/277V). See Specification Section 26 05 19, Low-Voltage Electrical Power Conductors and Cables, for required conductor color code for this project. Include identification of both voltage systems on each label, regardless of the voltage of the panelboard to which the label is affixed. Comply with requirements of NEC 210.5.

3.03 DEVICE LABELS

A. Reference 3.01, General Installation Requirements.

B. Install per manufacturer's instructions and recommendations.

C. Degrease and clean surfaces to receive labels.

3.04 WIRE MARKERS

A. Reference 3.01, General Installation Requirements.

B. Install per manufacturer's instructions and recommendations.

C. Provide wire markers on each conductor for power, control, signalling and communications circuits.

D. Where switches control remote lighting or power outlets, or where switches or outlets in same location serve different purposes, such as light, power, intercom, etc. or different areas, such as corridor and outside, provide plates with 1/8-inch black letters indicating function of each switch or outlet. Also label the function of light switches where two or more are mounted in same locations.

3.05 CONDUIT MARKERS

A. Reference 3.01, General Installation Requirements.

B. Install per manufacturer's instructions and recommendations.

3.06 UNDERGROUND WARNING TAPE

A. Reference 3.01, General Installation Requirements.

B. Install per manufacturer's instructions and recommendations.

C. Identify underground raceways using underground warning tape. Install one continuous tape per underground raceway at 6- to 8-inches below finish grade. Where multiple underground raceways are buried in a common trench and exceeds 16-inch width, install multiple warning tapes not over 10-inches apart (edge to edge) over the entire group of underground raceways.

END OF SECTION