

SECTION 00 10 00

INSTRUCTIONS TO BIDDERS

WTP Building Improvements 2026 , Project 25-1199

ARTICLE 1 – GENERAL

1.01 The scope of work is as described below and specified in applicable parts of these Contract Documents, including the Drawings.

This project includes, but is not limited to the following Work:

1. Interior and exterior renovation of the primary occupied spaces of Clackamas River Water 's operations building.
2. Demolition of existing exterior walls, windows, and doors as well as construction of new exterior walls, windows and doors in kind. Existing concrete columns, floors and roof to remain.
3. Demolition of interior partition walls and reconfiguration of existing occupied spaces.
4. Contractor and Subcontractors to review construction documents and provide code required MEPP design in coordination with the architecture plans. Further modifications may be required.

In submitting a bid for and executing the required work, the Contractor shall comply with all the requirements of the bid documents, as specified in the documents and drawings herein.

ARTICLE 2 - COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents must be used in preparing Bids; neither Owner nor Architect assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.02 Owner and Architect , in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work. By providing copies of Bidding Documents, Owner and Architect do not confer a license or grant for any other use.

ARTICLE 3 - QUALIFICATIONS OF BIDDERS

3.01 To demonstrate qualifications to perform the work, each bidder must be prepared to submit within five days of Owner 's request written evidence, such as financial data, previous experience; present commitments and other such data as may be called for below. Each bid must contain evidence

of bidder's qualification to do business in Oregon and demonstrate that the bidder has a valid license from the Oregon Construction Contractors Board (CCB) for the type of work specified.

3.02 The Owner shall review the qualifications of the apparent low bidder and its subcontractors. If in the sole judgment of the Owner, the apparent low bidder is not sufficiently experienced and capable to perform the work in a proper and expedient manner, the Owner may, at their sole discretion, declare the bidder non-responsible and consider the bid of the next lower bidder.

3.03 All bidders will be subject to a determination of responsibility under ORS 279C.375. Such determination includes findings by the Owner that the bidder:

- A. Has available the appropriate financial, material, equipment, facility and personnel resources and expertise, or the ability to obtain the resources and expertise, necessary to meet all the contractual responsibilities.
- B. Holds current licenses that businesses or service professionals operating in this state must hold in order to undertake or perform the work specified in the contract.
- C. Is covered by liability insurance and other insurance in amounts required in the solicitation documents.
- D. Qualifies as a carrier-insured employer or a self-insured employer under ORS 656.407 or has elected coverage under ORS 656.128.
- E. Has disclosed the bidder's first-tier subcontractors in accordance with ORS 279C.370.
- F. Has a satisfactory record of performance.
- G. Has a satisfactory record of integrity.
- H. Is legally qualified to contract with Clackamas River Water as a public contracting agency.
- I. Possesses an unexpired certificate that the Oregon Department of Administrative Services issues under ORS 279A.167, if the bidder employs 50 or more full-time workers and submitted a bid for a procurement with an estimated contract price that exceeds \$500,000.
- J. Has supplied all necessary information in connection with the inquiry concerning responsibility.
- K. Has not been debarred by Clackamas River Water under ORS 279B.130.

ARTICLE 4 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

4.01 On request, Owner will provide Bidder access to the Sites to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall conduct such explorations, investigations, and studies without impact on the operation of any existing facilities and at its own cost and expense.

4.02 It is the responsibility of each Bidder before submitting a Bid to:

- A. Examine and carefully study the Bidding Documents, including all required certifications and any Addenda, and other related data identified in the Bidding Documents;
- B. Visit the Site and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. Become familiar with all federal, state, and local Laws and Regulations that may affect cost, progress, or performance of the Work;
- D. Carefully study all reports of explorations and tests of subsurface conditions at or contiguous to the Site;
- E. Obtain and carefully study (or assume responsibility for doing so) all additional or supplementary examinations, investigations, exploration, test, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto;
- F. Agree no further examinations, investigation, exploration, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;
- G. Become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- H. Correlate the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents;
- I. Promptly give Architect written notice of all conflicts, errors, ambiguities, or discrepancies Bidder discovers in the Bidding Documents and confirm the written resolution thereof by Architect is acceptable to Bidder; and
- J. Determine the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work or alert the Engineer of any deficiency noted by the potential Bidder.

4.03 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of the Bid Documents, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Architect written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Architect are acceptable to Bidder, and that the

Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 - PRE-BID CONFERENCE/SITE VISIT

5.01 There is a mandatory pre-bid meeting for this project . The meeting is scheduled for **01:30 PM On Tuesday, August 25, 2026** at the Water Treatment Plant located at 9100 SE Mangan Dr. .

5.02 Prospective bidders must attend the prebid site visit for a bid to be considered responsive.

ARTICLE 6 - SITE AND OTHER AREAS

6.01 The Site is identified in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor .

ARTICLE 7 - INTERPRETATIONS AND ADDENDA

7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Karin Holzgang, Contracts Coordinator, kholzgang@crwater.com Architect in writing. Interpretations or clarifications considered necessary by Architect ENGINEER in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Architect as having received the Bidding Documents. Questions received less than seven days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Architect .

ARTICLE 8 - BID SECURITY

8.01 A bid must be accompanied by a Bid security made payable to or for the benefit of the Owner in an amount not less than ten percent (10%) of the total bid, including all alternates that might be selected by the Owner. Such Bid security shall be in the form of a certified check, cashier's check or other form authorized by ORS 279C.365(5). If a surety Bid Bond is used, it must be in the form attached to these Instructions to Bidders.

8.02 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the

Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 10 days after the Notice of Award, Owner may annul the Notice of Award and the bid security of that bidder will be held by the Owner as provided by law. The Bid security of other Bidders whom OWNER believes have reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Agreement or 91 days after the Bid opening, whichever is later, whereupon Bid security furnished by such Bidders will be returned.

8.03 Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within 10 days after the Bid opening.

ARTICLE 9 - CONTRACT TIMES

9.01 The number of days within which, or the dates by which, the Work is to be (a) Substantially Completed and (b) also completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 - LIQUIDATED DAMAGES

10.01 Provisions for liquidated damages are set forth in the Agreement.

ARTICLE 11 - SUBSTITUTE AND "OR-EQUAL" ITEMS

11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or equal" items, except for brand-name specifications. Whenever brand-names are specified in the specifications or Contract Documents, it is intended that this mean "brand name or equal". As such, the Bidder or contractor may request substitution of "or equal" items from the Architect, but such substitution is not allowed until the Architect has provided written approval of such. Application for substitutions for "or equal" items will be considered by the Architect during the bid period until 7 days prior to the bid date and then again after the award of the construction contract. The procedure for submission of any such application by Contractor and consideration by Architect is set forth in the General Conditions and Supplementary Conditions, as applicable. Approval of apparent equals or substitutions should not be assumed.

ARTICLE 12 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS

12.01 Not later than the time specified in the Invitation to Bid, Bidders shall submit to the Engineer the First Tier Subcontractor Disclosure form required by ORS 279C.370. The form is included with the Contract Documents – "Disclosure of First Tier Subcontractors Form" – and shall include a disclosure of

each subcontractor the Bidder proposes to sublet any portion of the work that is in excess of 5% of the total project bid or \$15,000, whichever is greater or \$350,000 regardless of the percentage of the total project bid. No first-tier subcontractor whose contract amount meets this requirement shall be used by the Contractor when the subcontractor is not listed on the Disclosure form. First-tier subcontractors can only be substituted in accordance with ORS 279C.585.

12.02 By submitting its bid, the Contractor will be certifying that it has not discriminated against minority-owned, emerging or women-owned businesses in obtaining subcontractors.

12.03 Contractor certifies that it complies with all other requirements of ORS 279C in use of Subcontractors.

ARTICLE 13 - PREPARATION OF BID

13.01 The Bid form is included with the Bidding Documents. Bids shall be made on the forms provided in the Contract Documents.

13.02 All blanks on the bid form shall be completed by printing in ink or by typewriter and the Bid signed by an authorized representative of the Bidder. A Bid price shall be indicated for each Bid item, in each Schedule listed therein, or the words "No Bid," "No Change," or "Not Applicable" entered.

13.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown below the signature.

13.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown below the signature.

13.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown below the signature.

13.06 A Bid by an individual shall show the Bidder's name and official address.

13.07 A Bid by a joint venture shall be executed by respective representatives of each joint venture member in the manner indicated on the Bid form accompanied by documentation showing the authority of each representative to sign on behalf of or bind the applicable joint venture. The official address of the joint venture must be shown below the signature.

13.08 All names shall be typed or printed in ink below the signatures.

13.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid form.

13.10 The address and telephone number for communications regarding the Bid shall be shown.

13.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in Oregon. Bidder's CCB contractor license number for Oregon shall be shown on the Bid form.

13.12 Non-resident bidders' (as that term is defined in ORS 279A.120) bids are subject to an out-of-state preference penalty equal to the percentage preference given in the bidder's state of residence.

ARTICLE 14 - BASIS OF BID; EVALUATION OF BIDS

14.01 Bidders shall submit a Bid on individual schedules or any combination of schedules as set forth in the Bid form. Submission of a Bid on any schedule included in the Bid package signifies the Bidder's willingness to not revoke the bid offer for a period of sixty days after the submittal of the bid and to enter into a Contract for the price offered as stated on the Bid form. Bidders offering a Bid on one or more schedules must be capable of completing the Work within the time period stated in the Agreement.

14.02 Bidders shall submit a Bid on a lump sum or unit price basis as set forth in the bid form. For Unit Price items, the total of all estimated prices will be determined as the sum of the products of the estimated quantity of each item and the unit price Bid for the item. The final quantities and Contract Price will be determined in accordance with paragraph 13.03 of the General Conditions. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

14.03 The bid price shall include amounts for overhead and profit on account of cash allowances, if any, as provided in paragraph 13.02 of the General Conditions.

ARTICLE 15 - SUBMITTAL OF BID

15.01 Bids shall be made on the forms provided. By submitting a bid, Bidders acknowledge they have reviewed all requirements of the Contract Documents whether Bidder obtained an electronic or hard copy from Owner .

15.02 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the advertisement or invitation to Bid and shall be enclosed in an opaque sealed envelope plainly marked with the Project title.

ARTICLE 16 - MODIFICATION AND WITHDRAWAL OF BID

16.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.

16.02 Any corrections made to entries on the bid form must be initialed by an authorized representative of the bidder.

ARTICLE 17 - OPENING OF BIDS

17.01 Bids will be opened at the time and place indicated in the advertisement or invitation to Bid and read aloud publicly unless no members of the public are present.

ARTICLE 18 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid form, but OWNER may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 - AWARD OF CONTRACT

19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder it finds, after reasonable inquiry and evaluation, to be non-responsible. Owner may also reject the Bid of any Bidder if Owner finds it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

19.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

19.03 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

19.04 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for

those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions, when applicable.

19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities to perform the Work in accordance with the Contract Documents. The bidder shall provide documents or background information requested by the Owner as part of the bid evaluation and pre-award processes.

19.06 If a Contract is awarded, the Owner will award the Contract to a Bidder meeting the requirements of the Bid and Contract Documents.

ARTICLE 20 - CONTRACT SECURITY AND INSURANCE

20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment Bonds and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by such Bonds and certificates of insurance.

ARTICLE 21 - SIGNING OF AGREEMENT

21.01 When Owner gives a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement with the other Contract Documents which are identified in the Agreement as attached thereto. Within 10 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner.

ARTICLE 22 – PREVAILING WAGE CONTRACT

22.01 All provisions of ORS 279C relating to prevailing wages are applicable to work done under this contract. Contractor shall meet all prevailing wage requirements including payment of bonds, fees, and submission of forms and certifications, that are required under Contractor's responsibilities in ORS 279C. If a Contractor or Subcontractor violates the referenced provisions the Owner may, at its option, terminate the contract or a subcontract and said Contractor or Subcontractor in such event shall forfeit all rights under the contract except to payment for actual labor and materials furnished to the District.

ARTICLE 23 – OWNER-DELEGATED SECURITY AND FIRE ALARM CONTRACTORS

23.01 Owner has designated the following Owner Delegated Contractors (ODC) for Division 28 systems work, as indicated in the Technology Responsibility Matrix, Drawing T0.01:

1. Fire Alarm: First Response.
2. Security and Access Control: Point Monitor.

Bidders shall include the designated ODC Contractors in their proposal and coordinate all work associated with Division 28 systems.

23.02 No substitutions of a designated ODC Contractor will be permitted without written approval from the owner.

23.03 The division of furnishing and installation responsibility for Division 28 systems work between the Contractor and each ODC Contractor is indicated in the Technology Responsibility Matrix, Drawing T0.01.

ARTICLE 24 – OWNER-CONTRACTED INTEGRATOR (SCADA)

24.01 The following requirements apply to the existing SCADA system:

- A. The Owner has retained, or will retain under a separate contract, Stoner Electric as the SCADA Integrator, assigned Owner-Contracted Integrator (OCI) responsibility in the Technology Responsibility Matrix, Drawing T0.01, to perform modifications and integration work associated with the SCADA system
- B. The OCI Integrator is not a subcontractor of the Contractor and shall operate under a separate contract with the Owner.
- C. Bidders shall include all costs required to coordinate their Work with the OCI Integrator.
- D. The division of furnishing, installation, and programming responsibility for SCADA/PLC/Controls work between the Contractor and the OCI Integrator is indicated in the Technology Responsibility Matrix, Drawing T0.01.
- E. All modifications to the existing SCADA system assigned Owner-Contracted Integrator (OCI) responsibility in the Technology Responsibility Matrix, Drawing T0.01 - including but not limited to SCADA software, PLC programs, HMI graphics, databases, network configurations, historian systems, alarms, reports, and integration with Owner control systems - shall be performed by the OCI Integrator.

- F. The Contractor shall provide the OCI Integrator with submittal and coordination information for Contractor-furnished equipment and infrastructure identified in the Technology Responsibility Matrix, Drawing T0.01, to support the OCI Integrator's programming and commissioning work.
- G. No contractor, subcontractor, supplier, or manufacturer representative shall modify the Owner's existing SCADA system without written approval from the Owner.

END OF SECTION

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SECTION 00500

AGREEMENT

WTP Building Improvements 2026 , Project 25-1199

THIS AGREEMENT is by and between Clackamas River Water (hereinafter called Owner) and _____(hereinafter called Contractor).

Owner and Contractor , in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or otherwise indicated in the Contract Documents. operations building.

2. Demolition of existing exterior walls, windows, and doors as well as construction of new exterior walls, window and doors in kind. Existing concrete columns, floors, and roof to remain.

3. Demolition of interior partition walls and reconfiguration of existing occupied spaces.

4. Contractor and Subcontractors to review construction documents and provide code required MEP design in coordination with the architectural plans. Further modifications may be required. The Work is generally described as follows:

1. Interior and exterior renovation of the primary occupied spaces of Clackamas River Water 's

ARTICLE 2 – THE PROJECT

2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:**WTP Building Improvements 2026 , Project 25-1199**

ARTICLE 3 – ARCHITECT

3.01 The Project has been designed by ZCS, Inc. The Architect is as defined by the Supplementary Conditions and shall assume all duties and responsibilities, and have the rights and authority assigned to Architect in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Days to Achieve Substantial Completion and Final Payment*

- A. The Work included shall be substantially completed within ~~107~~ 180 days after the date when the Contract Times commence to run, as provided in paragraph 4.01 of the General Conditions and completed and ready for final payment in accordance with paragraph 15.06 of the General Conditions within ~~107~~ 180 days after the date when the Contract Times commence to run. BY SUBMITTING ITS BID, BIDDER ACKNOWLEDGES THAT IT HAS SPECIFICALLY REVIEWED AND AGREED TO THE COMPLETION DATES IDENTIFIED IN THIS SECTION 4.02A.

4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the Work is not completed within the times specified in paragraph 4.02A above, plus any extensions thereof allowed in accordance with paragraph 11.08 and Article 12 of the General Conditions. This includes, but is not limited to, additional engineering and inspection costs, administration costs, and other related expenses. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time because such actual damages are difficult to ascertain with any certainty. Accordingly, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner \$150 for each day that expires after the time specified in paragraph 4.02A for Substantial Completion until the Work is substantially complete. The parties agree that the amount of liquidated damages represents a reasonable estimate of the actual damages that the Owner will incur as a result of delays in completing the Project. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner \$300 for each day that expires after the time specified in paragraph 4.02A for completion and readiness for final payment until the Work is completed and ready for final payment. BY SUBMITTING ITS BID, BIDDER ACKNOWLEDGES THAT IT HAS SPECIFICALLY REVIEWED AND AGREED TO THE LIQUIDATED DAMAGES IDENTIFIED IN THIS SECTION 4.03A.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of that item as indicated in the attached Bid Proposal, said sum being:

Bid Total: _____

_____ (\$ _____)

(use words)

(figures)

As provided in paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Architect as provided in paragraph 10.05 of the General Conditions. Unit prices have been computed as provided in paragraph 13.03 of the General Conditions.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Architect as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

- A. Upon condition that Contractor submits the applicable payment application in accordance with the Contract Documents, including Section 15.01 of the General Conditions, Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment within 15 days after the Owner approves the applicable invoice submitted by Contractor. The Owner anticipates that such payment will be on or about the 25th day of each month for invoices submitted by the tenth (10th) of the month during performance of the Work as provided in Paragraphs 6.02.B and 6.02.D below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.03.A.3 and Paragraph 2.03.A.3 of the General Conditions (and in the case of Unit Price Work based on the number of units completed). desior, in the event there is no schedule of values, as provided in the General Requirements.
- B. Prior to Substantial Completion, progress payments will be made in an amount equal to 95 percent of Work completed during the applicable period. The balance is to be held as retainage, or at Contractor's option, Contractor may submit and, unless Owner first finds in writing good cause for rejection that is based on unique project circumstances, Owner shall accept:

- a. bonds, securities, or other instruments of a character approved by the Director of the Oregon Department of Administrative Services, as described in ORS 279C.560(6), deposited as provided in ORS 279C.560(4), or
 - b. a surety bond deposited as provided in ORS 279.560(7) and in the form provided in ORS 701.435(4).
- C. In all cases, payments pursuant to Paragraph 6.02.B are to be less the aggregate of payments previously made and less such amounts as Owner may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 15.01.E of the General Conditions.
- D. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 95 percent of the Work completed (unless Owner has accepted a surety bond, bond, security, or other approved instrument in lieu of all or a portion of retainage, in which case Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less an amount reflective of any partial retainage), less such amounts as Owner shall determine in accordance with paragraph 15.01.C.6 of the General Conditions.
- E. Contractor shall comply with the provisions of Oregon's Prompt Payment Act with respect to subcontractor payments as required by ORS 279C.570 (and related statutes following). Contractor or its subcontractors may be liable for interest on unpaid or late payments as provided by such statutes.

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Architect as provided in said paragraph 15.06.

ARTICLE 7 – INTEREST

7.01 Contractor may elect to have Owner deposit accumulated retainage in an interest-bearing account with a bank or other financial institution or pay interest on the accumulated retainage at the rate of two percent plus the discount rate on 90—day commercial paper that is in effect at the Federal Reserve Bank of San Francisco on the date that the retainage is paid.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

8.01 Contractor makes the following representations in submitting its Bid:

- A. Contractor has examined and carefully studied the Contract Documents and the other related data, documents and certifications identified in the Bidding Documents.

- B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Contractor has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site.
- E. Contractor has obtained and carefully studied (or assumes responsibility for having done so) all supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including applying the specific means, methods, techniques, sequences, and procedures of construction, if any, expressly required by the Contract Documents to be employed by, and safety precautions and programs incident thereto.
- F. Contractor does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has correlated the information known to Contractor, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.
- I. Contractor has given Architect written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Architect is acceptable to Contractor.
- J. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

- A. The Contract Documents consist of the following:

1. All materials bound together by the Owner for the Project (whether in one or more volumes), including all documents, technical specifications, appendices, and drawings;
2. Exhibits to this Agreement (enumerated as follows):
 - a. Notice to Proceed;
 - b. Contractor 's Bid;
 - c. Documentation submitted by Contractor prior to Notice of Award;
 - d. Addenda;
3. The following which may be delivered or issued on or after the Effective Date of
 - c. Change Order(s). the Agreement and are not attached hereto:
 - a. Written Amendments;
 - b. Work Change Directives;

B. There are no Contract Documents other than those listed above in this Article 9.

C. The Contract Documents may only be amended, modified, or supplemented as provided in Article 11 of the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

- A. Defined terms used in this Agreement will have the meanings indicated in the Contract Documents.
- B. All references in this Agreement to Articles, sections, or paragraphs in the General Conditions refer to those Articles, sections, or paragraphs as they are modified by the Supplementary Conditions, if applicable.

10.02 *Assignment of Contract*

- A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 *Successors and Assigns*

- A. Subject to the restrictions on assignment or other transfer of rights as provided in the Contract Documents, Owner and Contractor each binds itself, its partners, successors,

assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement in duplicate. One counterpart each has been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or identified by Owner and Contractor or on their behalf.

This Agreement will be effective on _____, 20_____.

Owner :

Contractor :

Clackamas River Water

By:_____

By:_____

Address for giving notices:

Address for giving notices:

License No. _____
(where applicable)

Agent for service of process: _____

END OF SECTION

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**SECTION 01 10 00
SUMMARY**

PART 1 GENERAL

1.01 PROJECT

- A. Project Name: WTP Building Improvements 2026
 - 1. Project Location: 9100 SE Mangan Dr., Clackamas, OR 97015
- B. Owner's Name: Clackamas River Water.
- C. Architect's Name: ZCS, Inc..
 - 1. Architect's Consultants: The Architect has retained the following design professional who have prepared designated portions of the Contract Documents:
 - a. Structural: ZCS Inc.
 - b. Plumbing, Mechanical, Electrical, Fire Protection and Technology: Interface Engineering
- D. The Project consists of the demolition and alteration of exterior facade elements and reconfiguration of existing spaces..
- E. Separate Design Professional: Owner has separately retained RH2 Engineering (Justin R. Barrow, P.E., Oregon License No. 94740, Exp. 12/31/2027) to prepare Drawings G01 and M01–M05 and E01, "Clackamas River Water – Rooms 101 & 102 HVAC Improvements" (RH2 Job No. 24.0184.02, dated June 22, 2026), for HVAC, louver/damper, exhaust fan, door, and associated electrical work in Rooms 101 and 102 ("Independent Scope of Work"). See Article 1.06.

1.02 CONTRACT DESCRIPTION

- A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 50 00 - Agreement
- B. The Independent Scope of Work is included within this single prime contract. Combining it into one Contract for bidding and construction does not merge, transfer, or share design responsibility among the Engineers of Record identified in Article 1.06.B.

1.03 DESCRIPTION OF ALTERATIONS WORK

- A. Scope of demolition and removal work is indicated on drawings.
- B. Scope of alterations work is indicated on drawings.
- C. Scope of the Independent Scope of Work is shown on the drawings identified in Article 1.01.E. Coordinate Door 1 and Door 4 exterior work with the Architect's exterior facade Work.

1.04 OWNER OCCUPANCY

- A. Owner intends to continue to occupy adjacent portions of the existing building during the entire construction period.
- B. Owner intends to occupy a certain portion of the Project prior to the completion date for the conduct of normal operations.
- C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- D. Schedule the Work to accommodate Owner occupancy.

1.05 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on drawings and areas indicated on Site Logistics Plan.
- B. Arrange use of site and premises to allow:
 - 1. Owner occupancy.
- C. Provide access to and from site as required by law and by Owner:

1. 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.
 2. Do not obstruct roadways, sidewalks, or other public ways without permit.
- D. Utility Outages and Shutdown:
1. Coordinate shutdown of utilities with Owner and limit disruption of utility shutdowns and with Section 01 14 00.
 2. Prevent accidental disruption of utility services to other facilities.

1.06 INDEPENDENT SCOPE OF WORK

- A. General: This Project includes two independent scopes of work, prepared by separate design professionals under separate agreements with Owner, combined into one bid package and Contract. Combination does not merge, transfer, or share design responsibility among the Engineers of Record in Article 1.06.B.
- B. Engineers of Record:
1. ZCS, Inc. – Architect and Structural EOR for all Drawings and Specifications, excluding the Independent Scope of Work.
 2. Interface Engineering – MEP/FP/Technology EOR for all Drawings and Specifications, excluding the Independent Scope of Work.
 3. RH2 Engineering (Justin R. Barrow, P.E.) – EOR for the Independent Scope of Work, Drawings G01, M01–M05, and E01, retained directly by Owner.
- C. Applicability of Specifications: Divisions 02–49 of this Project Manual apply only to Work shown on Drawings identified in Article 1.06.B.1 and 1.06.B.2. No technical specifications apply to, or have been prepared for, the Independent Scope of Work; Contractor shall price that Work from the Drawings identified in Article 1.06.B.3 and standard construction practice.
- D. RFIs and Submittals: Direct RFIs and submittals for the Independent Scope of Work to RH2 Engineering.
- E. Exclusions: Items marked “NIC” or “by others” on the Independent Scope of Work drawings are not part of this Contract; Owner's separate controls contractor provides that work.
- F. Coordination: Contractor is solely responsible for field coordination between the Independent Scope of Work and all other Work, including door hardware, electrical, and structural interfaces.
- G. Limitation of Responsibility: The Architect and its consultants assume no responsibility for the adequacy, completeness, or code compliance of the Independent Scope of Work.

1.07 OWNER-DELEGATED AND OWNER-CONTRACTED SYSTEMS

- A. Security and Access Control Contractor: Point Monitor — Owner Delegated Contractor (ODC) per the Technology Responsibility Matrix, Drawing T0.01; subcontracted to the Contractor.
- B. Fire Alarm Contractor: First Response — Owner Delegated Contractor (ODC) per the Technology Responsibility Matrix, Drawing T0.01; subcontracted to the Contractor.
- C. SCADA Integrator: Stoner Electric — Owner-Contracted Integrator (OCI) per the Technology Responsibility Matrix, Drawing T0.01; under separate contract directly with the Owner and not a subcontractor to the Contractor. See Section 00 10 00, Article 24 and Section 01 30 00 for coordination requirements.
- D. The Owner will furnish SCADA integration services under a separate contract through the OCI Integrator. The Contractor shall coordinate construction activities, startup activities, testing activities, and equipment readiness with the OCI Integrator.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01_14_00

WORK RESTRICTIONS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Requirements for sequencing and scheduling the Work affected by existing site and facility, work restrictions, and coordination between construction operations and plant operations.

1.02 SUBMITTALS

- A. Shutdown requests/schedule as defined herein

1.03 GENERAL CONSTRAINTS ON WORK AND SCHEDULING OF WORK

- A. Plant access for the Contractor will be provided at the West/Main gate.
- B. Water projects:
 - 1. The CRW water treatment plant is a critical part of the Owner's drinking water system.
 - 2. Conduct Work such that the Owner's ability to meet its customer's demands for treated drinking water shall not be impaired or reduced in terms of the required quantity or quality of treated water.
 - a. Do not impair the operational capabilities of essential elements of the treatment process or reduce treatment capacity below levels sufficient to meet demands for water throughout the contract time.
 - 3. The status of the treatment plant shall be defined as operational when the plant is capable of meeting the Owner's customer's demands for treated drinking water in terms of the required quantity or quality of treated water.

1.04 COMPLIANCE WITH DRINKING WATER PERMIT

- A. The existing facility is operating under the terms of a drinking water permit issued by the Oregon Health Authority.
 - 1. This permit specifies the water quality limits that the plant must meet prior to discharge of finished water.
 - 2. Regulatory requirements for drinking water are defined in the Oregon Administrative Rules.
- B. Perform work in a manner that will not prevent the existing facility from achieving the finished water quality requirements established by regulations.
- C. Bear the cost of penalties imposed on the Owner for water quality violations caused by actions of the Contractor.

- D. Conduct the Work as defined in the Contract to keep the existing plant continuously operational.

1.05 UTILITIES

- A. Maintain electrical, telephone, water, gas, sanitary facilities, and other utilities within existing facilities in service, except where specifically allowed herein.

1.06 WORK BY OTHERS

- A. Where proper execution of the Work depends upon work by others, inspect and promptly report discrepancies and defects.

1.07 SHUTDOWN CONSTRAINTS

- A. General shutdown constraints:
 - 1. Execute the Work while the water treatment facility is in operation.
 - 2. All activities shall be accomplished without a shutdown, except where specifically indicated herein.
 - 3. Apply to activities of construction regardless of process or work area.
 - 4. Activities that disrupt plant or utilities operations must comply with these shutdown constraints.
 - 5. Organize work to be completed in a minimum number of shutdowns.
 - 6. Provide thorough advanced planning, including having required equipment, materials, and labor on hand at time of shutdown.
 - 7. Final determination of the permitting of shutdowns will be the sole judgment of the Owner.
 - 8. Owner maintains the ability to abort on the day of the scheduled shutdown.
 - 9. Unplanned shutdowns due to emergencies are not specified in this Section.
- B. Shutdown limitations:
 - 1. Shutdowns or other activities that disrupt plant operations are prohibited, except in the following circumstances:
 - a. Unless expressly granted by the Owner with 2-weeks advanced notice.
 - 2. Maximum shutdown duration: 24 hours.
 - 3. Schedule no more than 1 shutdown per Week.
 - 4. Maximum number of shutdowns: 2
 - 5. Shutdowns are only permitted between November 1 and March 1.
 - 6. Shutdowns outside of these limitations may be accommodated at the Owners discretion and should not be relied upon.

1.08 WORK RESTRICTIONS

- A. Maintain access to second and third stories for Owner's use for normal treatment facility operations throughout project duration.
 - 1. Whenever primary interior access to the second floor (including the main stair and front entry) is obstructed, blocked, or otherwise unavailable due to construction activities — including but not limited to hazardous materials abatement, front entry remodeling, or other Work restricting normal circulation — the Contractor shall provide and maintain a temporary exterior stair to preserve Owner access to the second floor.

2. Location: Coordinate the exact location of the temporary exterior stair with the Owner in advance. Anticipated locations include the area east of the front entry or the rear of the building near the MCC/parts room or flash mix area; final location subject to Owner approval and field conditions.
 3. The temporary stair shall remain in place and available for Owner use for the duration that primary access is obstructed, and shall comply with applicable code requirements for temporary means of access/egress, including guardrails, handrails, slip-resistant treads, and adequate lighting
- B. All work shall be performed without impact to normal water treatment facility operations, except as specifically defined herein.
- C. SCADA Office 110B:
1. Work to be completed within a 2-month period and then returned to Owner for normal use. Coordinate 2-month duration with Owner.
 2. An area of approximately 100 SF around the existing sink will need to remain in normal use until improvements to the Ops Lab (207) is substantially complete for the lab sample sink (occupiable and operational for the Owner's use).
 - a. Leave the sink area available.
- D. Alum Tank Equipment Curb (Alum 108):
1. The Alum tank and associated chemical feed system must be operational any time the WTP is in operation. Any contractor activities requiring shutdown of this system shall comply with the shutdown requirements herein.
- E. Analytical Lab 209:
1. Work to be completed within a 2-month period and then returned to Owner for normal use. Coordinate 2-month duration with Owner.
- F. Soda Ash Feeder Piping Relocation:
1. With 72 hours advance notice one (1) Soda Ash Feeder may be shutdown for maximum of one 5-day period within any two (2) consecutive weeks.
 2. At no point during construction shall both Soda Ash Feeders be out of service due to contractor activities.
- G. SCADA Server 100A:
1. Prioritize demo, flooring, demising wall, and HVAC/electrical work in this room ahead of other Work to allow Owner's IT infrastructure to be operational before the remainder of the Project proceeds.
 2. Complete Work in this room within 45 days of the Contract Times commencement date, and return to Owner for normal use. Coordinate duration with Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

ZCS INC.
CRW #: 25-1199

WTP BUILDING IMPROVEMENTS 2026
CLACKAMAS, OREGON

ATTACHMENT A – WTP SCHEDULED SHUTDOWN REQUEST FORM



SCHEDULED SHUTDOWN REQUEST FORM

Owner: _____ Date: _____
Contractor: _____ Carollo Project No.: _____
Project Name: _____ Submittal No.: _____
Submittal Title: _____ Spec/Drawing. Ref.: _____

TASK TITLE: (Provide <10 word title)		SUBMITTAL DATE: (No later than 28 days prior to work)			
SCHEDULE OF WORK ACTIVITY: START: (Date/Time) _____ END: (Date/Time) _____					
REQUESTOR: _____					
PRIMARY POINT OF CONTACT: _____		PHONE/PAGER: _____			
SECONDARY POINT OF CONTACT: _____		PHONE/PAGER: _____			
NOTIFY: ☐	Control Room, Phone: _____	☐	Security, Phone: _____		
BUILDING: _____		LOCATION OF WORK FLOOR/LEVEL: _____			
DESCRIPTION OF WORK: (Provide sufficient details on process isolation, work sequencing, and safety (i.e. control of significant hazards unique to the work) to demonstrate an understanding of the work and how it will be completed within the constraints, and its impact on the processes and facility.)					
Task Summary: _____					
Processes Affected: _____					
Trades Affected: _____					
WORK PLAN:					
Work Sequencing: _____					
Process Isolation: _____					
Spill Prevention Plan: _____					
Contingency Plans: _____					
CRITICAL EQUIPMENT/TOOLS: (Pumps and discharge hoses with correct fittings, blind flanges and pipe plugs, no-hub fittings, properly sized electrical service components, generators, portable lighting, chlorine for potable water pipe breaks, etc.)					
☐	Acoustic Ceiling/or Walls Access	☐	Excavation Permit	☐	Lock Out/Tag Out
☐	Chemical Use Approval	☐	Fire Sprinkler Impairment	☐	Life Safety Systems
☐	Confined Space Permit	☐	Flammable Materials	☐	Roof Protocol
☐	Critical Lift Plan	☐	Flush/Discharge	☐	Work After Dark
☐	Energized Electrical Work	☐	High Pressure Test	☐	
☐	Elect. Panel Schedules	☐	Hot Work/Open Flame	☐	

EXISTING SERVICE(S) AT RISK:							
☐	Breathing Air	☐	Elect Normal	☐	Process Access	☐	Telephones
☐	Chemical Distribution	☐	Fire Protection	☐	Safety Showers	☐	UPS
☐	City Water	☐	HVAC	☐	SCADA	☐	VAX/DATA
☐	Communication	☐	Inert Gas	☐	Security	☐	
☐	Domestic Drain	☐	Instrument - Air	☐	Solvent Drain	☐	
☐	Elect-Bus Duct	☐	Life Safety System	☐	Specialty Gases	☐	
☐	Elect. Emergency	☐	Natural Gas	☐	Storm Drain	☐	
REVIEWER'S INSTRUCTIONS/COMMENTS: _____							
☐	PREJOB BRIEFING MUST BE COMPLETED PRIOR TO COMMENCING WORK:						
	Full Name (printed)	Signature	Phone	Date			
Submitted By							
System Owner							
Reviewer (if needed)							
Reviewer (if needed)							
Reviewer (if needed)							
Reviewer (if needed)							

ATTACHMENT B - READINESS CHECKLIST

READINESS CHECKLIST

(5 days prior to work)

Checklist provided as a guide but is not all inclusive.

1. Confirm all parts and materials are onsite: _____

2. Review work plan: _____

3. Review contingency plan: _____

ATTACHMENT C - SAFETY CHECKLIST

SAFETY CHECKLIST

(Just prior to commencing work)

Checklist provided as a guide but is not all inclusive.

1. Location awareness:
 - a. Emergency exits: _____
 - b. Emergency shower and eyewash: _____
 - c. Telephones and phone numbers: _____
 - d. Shut-off valve: _____
 - e. Electrical disconnects: _____
2. Inspect work area:
 - a. Take time to survey the area you are working in. Ensure that what you want to do will work. Do you have enough clearance? Is your footing secure? Do you have adequate lighting and ventilation? Are surrounding utilities out of the way for you to perform your work?
3. SDS (Safety Data Sheets):
 - a. Understand the chemicals and substances in the area you are working in by reading the SDS.
4. Lockout/tagout procedure:
 - a. Lockout/tagout energy sources before beginning work.
 - b. Make sure all valves associated with the work are locked out and tagged out on each side of the penetration.
 - c. Make sure the lines are depressurized.
5. Overhead work:
 - a. Use appropriate personal protective equipment; i.e., safety harness, lifeline, etc.
 - b. Select appropriate tie-off points; i.e., structurally adequate, not a pipe or conduit, etc.
 - c. Spotter assigned and in position.
 - d. Pipe rack access; i.e., check design capacity, protective decking or scaffolding in place, exposed valves or electrical switches identified and protected.
6. Safety equipment:
 - a. Shepherd's hook.
 - b. ARC flash protection.
 - c. Fire extinguisher.
 - d. Other: _____
7. Accidents:
 - a. Should accidents occur, do not shut off and do not attempt to correct the situation unless you are absolutely positive that your action will correct the problem and not adversely affect other people or equipment.
8. Review process start-up documents:
 - a. In the event the system is shutdown, the Control Center should have a working knowledge of the process start-up procedures in order to deal effectively with unforeseen events.
9. Evacuation procedures:
 - a. Do not obstruct evacuation routes.
 - b. Take time to survey the area for evacuation routes.

**SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General administrative requirements.
- B. Web-based project software service.
- C. Progress meetings.
- D. Submittals for review, information, and project closeout.
- E. Requests for Interpretation (RFI) procedures.
- F. Submittal procedures.
- G. Coordination with Owner-Delegated Security and Fire Alarm Contractor.
- H. SCADA coordination requirements.
- I. Unauthorized modifications to the Owner's SCADA and control systems.

1.02 RELATED REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: General product requirements.
- B. Section 01 78 00 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 GENERAL ADMINISTRATIVE REQUIREMENTS

- A. Make the following types of submittals to Architect:
 - 1. Requests for Interpretation (RFI).
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Design data.
 - 6. Manufacturer's instructions and field reports.
 - 7. Applications for payment and change order requests.
 - 8. Progress schedules.
 - 9. Coordination drawings.
 - 10. Correction Punch List and Final Correction Punch List for Substantial Completion.
 - 11. Closeout submittals.

1.04 COORDINATION WITH OWNER-DELEGATED SECURITY AND FIRE ALARM CONTRACTORS

- A. The General Contractor shall coordinate all scheduling, access, rough-in, power, pathway installation, and interface requirements with the Owner Delegated Contractors (ODC) for Security and Fire Alarm systems: Point Monitor (Security and Access Control) and First Response (Fire Alarm).
- B. The division of furnishing and installation responsibility between the Contractor and each ODC Contractor is indicated in the Technology Responsibility Matrix, Drawing T0.01.

1.05 SCADA COORDINATION REQUIREMENTS

- A. The Contractor shall coordinate all Work affecting the SCADA system with the Owner and Stoner Electric, the Owner-Contracted Integrator (OCI), per the Technology Responsibility Matrix, Drawing T0.01.
- B. The Contractor shall cooperate fully with the OCI Integrator and shall provide reasonable access to equipment, panels, devices, field wiring, network infrastructure, and project sites necessary for completion of SCADA integration services.

- C. Equipment submittals for any equipment monitored, controlled, alarmed, trended, or otherwise integrated into the SCADA system shall be provided to the OCI Integrator for review of compatibility and integration requirements.
- D. The division of furnishing, installation, and programming responsibility for SCADA/PLC/Controls work between the Contractor and the OCI Integrator is indicated in the Technology Responsibility Matrix, Drawing T0.01. The Contractor shall submit information for Contractor-furnished items identified therein; SCADA integration data (instrument data sheets, points lists, control sequences, protocol/register mapping, and similar) shall be developed and maintained by the OCI Integrator.
- E. The Contractor shall notify the Owner and the OCI Integrator at least 30 days prior to equipment startup activities requiring SCADA integration unless otherwise approved by the Owner.
- F. The Contractor shall schedule construction activities to allow the OCI Integrator adequate time to complete programming, graphics development, communications testing, commissioning, startup, training, and final acceptance testing.
- G. Delays resulting from the Contractor's failure to provide required information, access, equipment readiness, or advance notice shall be the responsibility of the Contractor.

1.06 UNAUTHORIZED MODIFICATIONS

- A. No contractor, subcontractor, supplier, manufacturer representative, or other party shall modify existing PLC programs, HMI graphics, databases, historian configurations, alarm management functions, server configurations, or network settings without authorization from the Owner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 WEB-BASED PROJECT SOFTWARE SERVICE

- A. Web-Based Project Software Service: Provide, administer, and use web-based project software to host and manage project communication and documentation.
 - 1. Include, at minimum, the following features:
 - a. Project directory, including Owner, Contractor, subcontractors, Architect, Architect's consultants, and other entities involved in the project. Include names of contact persons and contact information for each entity.
 - b. Access control for each entity and for each workflow process to determine each entity's digital rights to create, modify, view, and print documents.
 - c. Workflow planning, allowing customization of workflow for each project entity.
 - d. Creation, logging, tracking, and notification for project communications.
 - e. Tracking of project communication statuses in real time, including timestamped response log.
 - f. Procedures for viewing PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
 - g. Processing and tracking of payment applications.
 - h. Processing and tracking of contract modifications.
 - i. Creation and distribution of meeting minutes.
 - j. Document management for drawings, specifications, and coordination drawings, including revision control.
 - k. Management of construction progress photographs.
 - l. Mobile device compatibility.
 - m. Creation of data analytics reports.
 - n. Creation and export of editable logs for software functions. Provide Owner, Architect, and Architect's consultants with rights and ability to download logs when requested.
 - 2. Cost: Pay cost of service. Include the cost of the service in the contract sum.
 - 3. Provide user licenses for use by Owner, Architect, Architect's consultants, and other entities involved in the project.

4. Comply with the software service's current published licensing agreements.
5. Training: Provide one-hour, web-based training session for users of software service. Further training is the responsibility of the user.
 - a. Representatives of Owner are scheduled and included in this training.
6. Project Closeout: Architect determines when to terminate the software service for the project and is responsible for obtaining archive copies of files for Owner.
7. Web-Based Project Software Services: The selected service is:

3.02 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required:
 1. Contractor.
 2. Owner.
 3. Architect.
 4. Contractor's superintendent.
 5. Major subcontractors.
- 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 log and status of responses.
 7. Maintenance of progress schedule.
 8. Corrective measures to regain projected schedules.
 9. Planned progress during succeeding work period.
 10. Maintenance of quality and work standards.
 11. Effect of proposed changes on progress schedule and coordination.
 12. 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.

3.03 REQUESTS FOR INTERPRETATION (RFI)

- A. Definition: A request seeking one of the following:
 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
 2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
- C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
 1. Prepare a separate RFI for each specific item.
 - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.

- b. Do not forward requests which solely require internal coordination between subcontractors.
 - 2. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
 - 1. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
 - a. Approval of submittals (use procedures specified elsewhere in this section).
 - b. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
 - 2. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
 - 3. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
- E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
 - 1. Official Project name and number, and any additional required identifiers established in Contract Documents.
 - 2. Discrete and consecutive RFI number, and descriptive subject/title.
 - 3. Issue date, and requested reply date.
 - 4. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
 - 5. Annotations: Field dimensions and/or description of conditions which have engendered the request.
 - 6. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
- F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
 - 1. Indicate current status of every RFI. Update log promptly and on a regular basis.
 - 2. Note dates of when each request is made, and when a response is received.
 - 3. Highlight items requiring priority or expedited response.
- H. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
- I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
 - 1. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.

3.04 SUBMITTAL SCHEDULE

- A. Submit to Architect for review a schedule for submittals in tabular format.
 - 1. Coordinate with Contractor's construction schedule and schedule of values.
 - 2. Format schedule to allow tracking of status of submittals throughout duration of construction.

3. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
 - a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.05 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 compliance with information given and the design concept expressed in 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.

3.06 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 or for Owner.

3.07 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 compliance with 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.

3.08 SUBMITTAL PROCEDURES

- A. General Requirements:
 1. Use a separate transmittal for each item.
 2. Transmit using approved form.
 - a. Use Contractor's form, subject to prior approval by Architect.
 3. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
 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.
 6. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
 - a. Upload submittals in electronic form to Electronic Document Submittal Service website.
 7. 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.
 8. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
 9. Provide space for Contractor and Architect review stamps.
 10. When revised for resubmission, identify all changes made since previous submission.
 11. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
 12. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
 13. Submittals not requested will be recognized, and will be returned "Not Reviewed",
- B. Product Data Procedures:
1. Submit only information required by individual specification sections.
 2. Collect required information into a single submittal.
- C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
 2. Do not reproduce Contract Documents to create shop drawings.
 3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
- D. Samples Procedures:
1. Transmit related items together as single package.
 2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
 3. Submit a minimum of two full set(s) of available sample choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will retain one copy of the selected sample(s) and return remaining samples to the Contractor.
 4. Contractor to maintain one set of approved samples at Project site, available for quality-control comparisons throughout the course of construction activity.

3.09 SUBMITTAL REVIEW

- A. Submittals for Review: Architect will review each submittal, indicate corrections or revisions required, and return it.
- B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.
- C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
- D. Architect's and consultants' actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:

- a. "Approved", or language with same legal meaning.
 - b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
 - 1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
 - c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
- 2. Not Authorizing fabrication, delivery, and installation:
- E. Architect's and consultants' actions on items submitted for information:
 - 1. Items for which no action was taken:
 - a. "Received" - to notify the Contractor that the submittal has been received for record only.
 - 2. Items for which action was taken:
 - a. "Reviewed" - no further action is required from Contractor.

END OF SECTION

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SECTION 08 43 13
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aluminum-framed storefront, with vision glass.
- B. Aluminum doors.
- C. Weatherstripping.

1.02 RELATED REQUIREMENTS

- A. Section 08 71 00 - Door Hardware: Hardware items other than specified in this section.

1.03 REFERENCE STANDARDS

- A. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
- B. [AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels \(with Coil Coating Appendix\).](#)
- C. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site.
- D. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
- E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- F. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).
- G. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- H. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- I. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
 - 1. Include design engineer's stamp or seal on shop drawings for attachments and anchors.
- D. Samples: Submit two samples 2x2 inches in size illustrating finished aluminum surface, glass, glazing materials.
- E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- F. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
- G. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- H. Manufacturer's qualification statement.

- I. Installer's qualification statement.
- J. Specimen warranty.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of type specified, with minimum 3 years of documented experience.
 - 1. Provide company, field supervisors, and installers that hold active ANSI-accredited certifications in appropriate categories for work specified.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Workmanship Warranty: Manufacturer and Installer agree to repair or replace components of aluminum-framed entrance and storefront systems that fail in materials or workmanship within a 2 year period after Date of Substantial Completion.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures, including, but not limited to, excessive deflection.
 - b. Noise or vibration created by wind and thermal and structural movements.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
 - d. Water penetration through fixed glazing and framing areas.
 - e. Failure of operating components.
- C. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within 10 year period after Date of Substantial Completion.
 - 1. Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
- D. Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of anodized finishes within 5 year period after Date of Substantial Completion.
 - 1. Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D 2244.
 - b. The finished Metal will not crack, blister, check or peel.

1.08

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Aluminum-Framed Storefronts:
 - 1. Kawneer North America; Basis of Design: www.kawneer.com/#sle.
~~Oldcastle Building Envelope: www.oldcastlebe.com/#sle.~~
 - 2. CRL - US Aluminum: www.crlaurence.com.
 - 3. EFCO Corporation: efcocorp.com
- B. Entrance Doors:

2.02 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

- A. Center-Set Style, Thermally-Broken:

1. Basis of Design: Trifab VersaGlaze 451UT Framing System.
2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.

2.03 BASIS OF DESIGN -- SWINGING DOORS

- A. Entrance Doors, Various Stile Widths:
1. Basis of Design: 500T Insulpour Thermal Entrances.
 2. Thickness: 2-1/4" inches.
 3. Wide Stile, Insulating Glazing, Thermally-Broken

2.04 ALUMINUM-FRAMED STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.

~~Finish: Class I color anodized.~~

~~Factory finish all surfaces that will be exposed in completed assemblies.~~

~~Finish Color: As selected by Architect from manufacturer's standard line.~~

1. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
2. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
3. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
4. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
5. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
6. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
7. Maintain continuous air barrier and/or vapor retarder seal throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel, and heel bead of glazing compound.

B. Performance Requirements

1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
 - a. Design Wind Loads: Comply with requirements of ASCE 7.
 - b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
2. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf.
3. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure difference.
4. Condensation Resistance Factor of Framing: 50, minimum, measured in accordance with AAMA 1503.
5. Energy Performance:
 - a. Thermal Transmittance (U-factor):
 - 1) Fixed Glazing and Framing Areas: U-0.36 max.
 - 2) Entrance Doors: U-0.63 max.
 - b. Solar Heat-Gain Coefficient (SHGC):
 - 1) Fixed Glazing and Framing Areas: 0.36 max.
 - 2) Entrance Doors: 0.33 max.

- c. Visual Transmittance (VT/SHGC): 1.10 min for all types.

2.05 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
 - 1. Framing members for interior applications need not be thermally broken.
 - 2. Glazing Stops: Flush.
 - 3. Cross-Section: 2" by 4-1/2" inch nominal dimension.
- B. Glazing: See Section 08 80 00.
 - 1. For Exterior Framing: Type IGU.
- C. Swing Doors: Glazed aluminum.
 - 1. Thickness: 2-1/4" inches.
 - 2. Top Rail: 5 inches wide.
 - 3. Vertical Stiles: 5 inches wide.
 - 4. Bottom Rail: 10 inches wide.
 - 5. Glazing Stops: Square.
 - 6. Finish: Same as storefront.

2.06 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Fasteners: Stainless steel.
- C. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.07 FINISHES

- A. Factory Finished High Performance Organic Coating: Primer and topcoat coatings system based on super durable polyester resin powder containing high level of isophthalic acid; with minimum dry film thickness (DFT) of 2 to 3.5 mil, 0.0020 to 0.0035 inch over aluminum extrusions and panels; meeting requirements of AAMA 2604.
 - 1. Products:
 - a. Basis of Design: Kawneer Permaflour, 70% PVDFG Fluoropolymer Coating
 - b. Color: As indicated on Drawings.

2.08 HARDWARE

- A. For each door, include weatherstripping and sill sweep strip.
- B. Other Door Hardware: As indicated in Drawings.
- C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- D. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

3.02 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Set thresholds in bed of sealant and secure.
- J. Install hardware using templates provided.
 - 1. See Section 08 71 00 for hardware installation requirements.
- K. Install glass using glazing method required to achieve performance criteria; see Section 08 80 00.
- L. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 ADJUSTING

- A. Adjust operating hardware for smooth operation.

3.05 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, and take care to remove dirt from corners and to wipe surfaces clean.

3.06 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

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**SECTION 08 51 13
ALUMINUM WINDOWS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Extruded aluminum windows with fixed sash and operating sash.
- B. Factory glazing.
- C. Operating hardware.
- D. Insect screens.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Wood perimeter shims.
- B. Section 07 25 00 - Adhesive-Backed Weather Barriers: Sealing frame to water-resistive barrier installed on adjacent construction.
- C. Section 07 92 00 - Joint Sealants: Sealing joints between window frames and adjacent construction.
- D. Section 08 80 00 - Glazing.

1.03 REFERENCE STANDARDS

- A. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products.
- B. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum.
- C. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
- D. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix).
- E. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site.
- F. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights.
- G. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
- H. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings.
- I. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- J. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).
- K. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- L. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- M. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors.
- N. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.
- O. ASTM E1332 - Standard Classification for Rating Outdoor-Indoor Sound Attenuation.
- P. ASTM F588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Include component dimensions, information on glass and glazing, internal drainage details, and descriptions of hardware and accessories.
- C. Shop Drawings: Indicate opening dimensions, elevations of different types, framed opening tolerances, anchorage locations, sections, details, hardware, attachments to other work, operational clearances, and installation requirements.
- D. Samples: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- E. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
 - 1. Evidence of AAMA Certification.
 - 2. Evidence of WDMA Certification.
 - 3. Evidence of CSA Certification.
 - 4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.
- F. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements in excess of those prescribed by specified grade.
- G. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- H. Manufacturer's qualification statement.
- I. Installer's qualification statement.
- J. Specimen warranty.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
- B. Installer Qualifications: Company specializing in performing work of type specified, with minimum 3 years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of AAMA CW-10.
- B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

- A. Field Measurements: Verify aluminum window openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.08 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2 manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Kawneer Company inc., Series AA5450 Ultra Thermal Fixed and Operable Windows (Standard Face).

- B. Other Acceptable - Aluminum Window Manufacturers:
 - 1. CRL - US Aluminum: www.crlaurence.com
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ALUMINUM WINDOWS

- A. Aluminum Windows: Extruded aluminum frame and sash, factory fabricated, factory finished, with operating hardware, related flashings, and anchorage and attachment devices.
 - 1. Frame Depth: 4-5/8 inch.
 - 2. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for operating hardware and imposed loads.
 - 3. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
 - 4. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
 - 5. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

2.03 PERFORMANCE REQUIREMENTS

- A. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type with performance requirements indicated, based on testing manufacturer's windows that are representative of those specified, and that are of minimum test size indicated below:
 - 1. Test size: 60" x 99".
- B. Structural Performance: Provide aluminum windows capable of withstanding the effects of the following loads, based on testing units representative of those indicated for the Project that pass AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Uniform Load Structural Test:
 - 1. Design Wind Loads: Determine design wind loads applicable to the Project from basic wind speed indicated in miles per hour, according to ASCE 7, Section 6.5, "Method 2- Analytical Procedure," based on mean roof heights above grade indicated on Drawings.
 - a. Basic Wind Speed: 107 MPH.
 - b. Exposure Factor: C.
 - c. Importance Factor : 1.0.
 - 2. Deflection: Design glass framing system to limit lateral deflections of glass edges to less than 1/175 of glass-edge length or 3/4 inch (19 mm), whichever is less, at design pressure based on testing performed according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Test or structural computations.Uniform Load Deflection.
- C. Thermal Movements: Provide aluminum windows, including anchorage, that allow for thermal movements resulting from the following maximum change 80 deg in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
- D. Condensation Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, with a CRF not less than: 78 (frame) and 79 (glass).
- E. Temperature Index (I): Provide aluminum windows tested for thermal performance according to CSA-A440 with a Temperature Index not less than: 68 (frame) and 75 (glass).
- F. Energy Efficiency:
 - 1. Thermal Transmittance Test (U-Factor): When tested to AAMA specification 1503, AAMA specification 507 or NFRC 100 the thermal transmittance (U-Factor) shall not be more than:
 - a. Fixed Glazing and Framing Areas: U-0.36 max.
 - b. Operable: U-0.45 max.

2. Solar Heat-Gain Coefficient (SHGC): Provide aluminum windows with a whole-window SHGC as determined according to NFRC 200 and AAMA 507 procedures.
 - a. Fixed Glazing and Framing Areas: 0.36 max.
 - b. Operable: 0.33 max.
3. Visual Transmittance (VT/SHGC): 1.10 min for all types.
- G. Performance Class and Grade:
 1. Fixed Window: AW-PG70-FW.
 2. Operable Window: AW-PG40-HS.
- H. Air Leakage: 0.1 cfm/sq ft maximum leakage per unit area of outside window frame dimension when tested in accordance with ASTM E283/E283M.
- I. Air Infiltration: Maximum rate not more than indicated when tested according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Air Infiltration Test.
 1. Maximum Rate: 0.1 cfm/sq. ft. (0.5 L/s•m²) of area at an inward test pressure of 6.24 lbf/sq. ft. (300 Pa) in accordance with ASTM E283.
- J. Water Resistance: No water leakage as defined in AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS) referenced test methods at a water test pressure equaling that indicated, when tested according to ASTM E547 and ASTM E331.
 1. Test Pressure: 20 percent of positive design pressure, but not more than 10 lbf/sq. ft. (478 Pa).
- K. Forced Entry Resistance: Tested to comply with ASTM F588 requirements for performance level of Grade 10 for specific window style required.
- L. Acoustic Performance: Minimum outdoor-indoor transmission class (OITC) rating of 34, when tested in accordance with ASTM E90 and ASTM E1332.

2.04 MATERIALS

- A. Extruded Aluminum: Alloy and temper recommended by aluminum window manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and sash members.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components.
- C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- E. Sliding-Type Weather Stripping: Provide woven-pile weather stripping of wool, polypropylene, or nylon pile and resin-impregnated backing fabric. Comply with AAMA 701/702.
 1. Weather Seals: Provide weather stripping with integral barrier fin or fins of semi-rigid, polypropylene sheet or polypropylene-coated material. Comply with AAMA 701/702.
- F. Sealant: For sealants required within fabricated windows, provide window manufacturer's standard, permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

2.05 GLAZING

- A. Glass and Glazing Materials: Refer to Division 08 Section "Glazing" for glass units and glazing requirements applicable to glazed aluminum window units.
- B. Glazing System: Glazing method shall be a wet/dry type in accordance with manufacturer's standards. Exterior glazing shall be silicone back bedding sealant. Interior glazing shall be

snap-in type glazing beads with an interior gasket in accordance with AAMA 702 or ASTM C864.

2.06 HARDWARE

- A. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock aluminum windows, and sized to accommodate sash weight and dimensions.
- B. Horizontal Sliding Windows: Provide the following operating hardware:
 - 1. Handle: Continuous, integral pulls.
 - 2. Sash Locks.
 - 3. Composite adjustable tandem roller.
 - 4. Stainless Steel roller track.
 - 5. Standard auto lock.

2.07 FABRICATION

- A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fit joints; make joints flush, hairline and weatherproof.
 - 3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.
 - 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 6. Provisions for field replacement of glazing.
 - 7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- B. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
- C. Fabricate aluminum windows that are re-glazable without dismantling sash or framing.
- D. Thermally Improved Construction: Fabricate aluminum windows with an integral, concealed, materials and window members exposed on interior side; in a manner that eliminates direct metal-to-metal contact. Thermal barriers shall be designed low-conductance thermal barrier; located between exterior in accordance with AAMA TIR A8.
 - 1. Frame thermal barrier shall be polyamide with a minimum of 1" (25.4 mm) separation, installed continuously and mechanically bonded to the aluminum.
 - 2. Sash thermal barrier shall be polyamide with a minimum of 1/2" (12.7 mm) separation, installed continuously and mechanically bonded to the aluminum.
- E. Weather Stripping: Provide full-perimeter weather stripping for each operable sash.
- F. Weep Holes: Provide weep holes and internal passages in window frames to conduct infiltrating water to exterior.
- G. Provide water-shed members as required above lines of natural water penetration.
- H. Mullions: Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.
- I. Sub frames: Provide sub frames with anchors for window units as shown, of profile and dimensions indicated but not less than 0.093-inch (2.4-mm) thick extruded aluminum. Miter or cope corners, and join with concealed mechanical joint fasteners. Finish to match window units. Provide sub frames capable of withstanding design loads of window units.

- J. Factory-Glazed Fabrication: Glaze aluminum windows in the factory where practical and possible for applications indicated. Comply with requirements in Division 08 Section "Glazing" and with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).
- K. Glazing Stops: Provide snap-on glazing stops coordinated with Division 08 Section "Glazing" and glazing system indicated. Provide glazing stops to match sash.

2.08 FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Factory Finished High Performance Organic Coating: Primer and topcoat coatings system based on super durable polyester resin powder; with minimum dry film thickness (DFT) of 2 to 3.5 mil, 0.0020 to 0.0035 inch over aluminum extrusions and panels; meeting requirements of AAMA 2604.
 - 1. Basis of Design: Kawneer Permaflour, 70% PVDFG Fluoropolymer Coating (~~Color as selected by Architect from manufacturer's full color line~~).
 - 2. Color: As indicated on Drawings.

~~Finish Color: As selected by Architect from manufacturer's standard range.~~

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances.
- B. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight window installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PRIME WINDOW INSTALLATION

- A. Install windows in accordance with manufacturer's instructions.
- B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
- D. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.
- E. Install aluminum framed storefront system and components to drain condensation, water penetrating joints, and moisture migrating within sliding window to the exterior.
- F. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.03 FIELD QUALITY CONTROL

- A. Provide field testing of installed aluminum windows by independent laboratory in accordance with AAMA 502 and AAMA/WDMA/CSA 101/I.S.2/A440 during construction process and before installation of interior finishes.
 - 1. Field test for water penetration in accordance with ASTM E1105 using Procedure B - cyclic static air pressure difference; test pressure shall not be less than 1.9 psf.
 - 2. Field test for air leakage in accordance with ASTM E783 with uniform static air pressure difference of 1.57 psf.
- B. Repair or replace fenestration components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.04 ADJUSTING

- A. Adjust hardware for smooth operation and secure weathertight closure.

3.05 CLEANING

- A. Remove protective material from factory finished aluminum surfaces.
- B. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.
- C. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.
- D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- E. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant and window manufacturer.

END OF SECTION

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SECTION 09 22 16
NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

~~Framing accessories.~~

- A. ~~Framing accessories.~~
- B. Suspension System Framing and Furring for Gypsum Board Assemblies.
- C. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.

1.02 RELATED REQUIREMENTS

- A. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
- B. Section 09 21 16 - Gypsum Board Assemblies: Execution requirements for anchors for attaching work of this section.

1.03 REFERENCE STANDARDS

- A. AISI S201 - North American Standard for Cold-Formed Steel Framing - Product Data.
- B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing.
- C. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- D. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data describing framing member materials and finish and product criteria.
- C. Manufacturer's qualification statement.
- D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. Company specializing in manufacturing the types of products specified in this section, and with minimum 3 years of documented experience.
- B. Single-Source Responsibility: To ensure proper interface, all drywall furring components shall be produced or supplied by a single manufacturer.
- C. All accessory components from other manufacturers shall conform to ASTM standards.
- D. Coordination of Work:
 - 1. All work above the ceiling line should be completed prior to installing the drywall sheet goods. There should be no materials resting against or wrapped around the suspension system, hanger wires or ties.

1.06 WARRANTY

- A. Suspensions System: Submit a written limited warranty executed by the manufacturer, agreeing to repair or replace grid components that are supplied with a hot-dipped galvanized coating or aluminum base material. Failures include, but are not limited to:
 - 1. The occurrence of 50% red rust as defined by ASTM D 610 test procedures as a result of defects in materials or factory workmanship.
- B. Warranty Period: Ten years from date of installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Armstrong FRAMEALL Drywall Grid.
- B. Suspension Systems:
 - 1. Armstrong World Industries, Inc.
 - 2. Certainteed Architectural.
 - 3. USG Corporation.
 - 4. Rockfon.

2.02 SUSPENSION SYSTEMS

- A. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 1. Structural Classification: Heavy-duty.
 - 2. Deflection of fastening suspension system supporting light fixtures, ceiling grilles, access doors, verticals and horizontal loads shall have a maximum deflection of 1/360 of the span.
 - 3. Steel 25 ga per ASTM C645.
 - 4. Galvanization coating per ASTM A1003 and ASTM A653.
- B. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.
- C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.
- D. Clips and Accessories:
 - 1. All Clips confirm to relative testing standards and heavy duty classifications.
- E. Miscellaneous:
 - 1. Screws for wallboard application shall be bugle head screws in accordance with thickness of material used.
 - 2. Corner bead: Minimum #26 gauge, zinc alloy or plastic square edge type with expanded flanges.
 - a. Casing bead: Minimum #24 gauge, zinc alloy or plastic square edge type with expanded flanges.
 - b. Control Joints: Minimum #26 gauge, roll-formed zinc alloy, extruded aluminum or plastic with expanded flanges.
 - c. Special Trim Shapes: As detailed on plans, extruded aluminum with acrylic coating by Fry Reglet or approved equal.

2.03 FRAMING MATERIALS

- A. Material and Product Requirements: AISI S201 and AISI S220.
- B. Nonstructural Framing System Components: Sheet steel, of size and properties necessary for spacing indicated on drawings.
 - 1. Resilient Furring Channels: Single or double leg configuration; 1/2 inch channel depth.
 - a. Products:
 - 1) CEMCO: www.cemcosteel.com/#sle.
 - 2) ClarkDietrich: www.clarkdietrich.com/#sle.
 - 3) MRI Steel Framing: www.mristeel framing.com/#sle.
 - 4) Steeler Inc: www.steeler.com/#sle.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that rough-in utilities are in proper location.

3.02 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

3.03 INSTALLATION - GENERAL

- A. Install suspension system and panels in accordance with the manufacturer's instructions, in compliance with ASTM installation standard, and with applicable codes as required by the authorities having jurisdiction.
- B. To secure to metal clips, concrete inserts, steel bar joist or steel deck, use power actuated fastener, or insert. Coordinate placement for hanger wire spaced as required for expected ceiling loads and layout.
- C. Install hanger wire as required with necessary on center spacing to support expected ceiling load requirements, following local practices, codes and regulations. Provide additional wires at light fixtures, grilles, and access doors where necessary. A pigtail knot shall be used with three tight wraps at top and bottom fastening locations.
- D. Add additional wire as needed when using compatible clips and accessories.
- E. Control Joints: Roll formed zinc alloy, aluminum, or plastic as required for expansion and contraction as shown on drawings.
- F. Expansion Joints: Roll formed zinc alloy, aluminum, or plastic as required for expansion and contraction as shown on drawings.
- G. Main beams shall be suspended from the overhead construction with hanger wire, spaced as required for expected ceiling loads, along the length of the main beams.
- H. Install cross tees at on center spacing as specified by the drywall manufacturer. Typical drywall cross tee spacing:
 - 1. 16 inches on center with 5/8 or 1/2 inch gypsum board.
 - 2. 24 inches on center with 5/8 inch gypsum board.
- I. Other items such as wood, sheet metal, or plastic panels should be screwed to comply with deflection limit equivalent to that of the ceiling installation.
- J. Use channel molding or angle molding to interface with Drywall Grid System to provide perimeter attachment or to obtain drop soffits, verticals, slopes, etc.
- K. For light fixtures (Type G, Type F) use secondary framing cross tees as required to frame opening.
- L. Single cross tees in a route hole to be secured by 7/16 inch framing screw or alternative methods.

3.04 INSTALLATION - INTERIOR APPLICATIONS

- A. Install main beams and cross tees at the on center spacing required for ceiling loading, and location of in-ceiling services.
- B. Additional bracing as required by code.

END OF SECTION

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**SECTION 09 91 13
EXTERIOR PAINTING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Floors, unless specifically indicated.
 - 6. Ceramic and other types of tiles.
 - 7. Glass.
 - 8. Concealed pipes, ducts, and conduits.

1.02 REFERENCE STANDARDS

- A. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating.
- B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials.
- C. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual.
- D. SSPC-SP 1 - Solvent Cleaning.
- E. SSPC-SP 6/NACE No.3 - Commercial Blast Cleaning.
- F. SSPC-SP 13/NACE No.6 - Surface Preparation of Concrete.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).
 - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
- D. Manufacturer's Instructions: Indicate special surface preparation procedures.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
 - 3. Label each container with color and type in addition to the manufacturer's label.

1.04 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience.

1.05 **MOCK-UPS**

- A. Prior to commencement of full exterior painting operations, provide paint color mockups on the building for Architect and Owner review.
- B. Mockups shall:
 - 1. Be located in areas approved by the Architect.
 - 2. Include each proposed exterior paint color scheduled for use on the Project and up to three additional colors to be selected by the Architect.
 - 3. Apply to actual project substrates using the specified surface preparation methods, cleaning, primers, coatings, and application techniques required by this Section.
 - 4. Be of sufficient size to clearly demonstrate color, texture, sheen, coverage, and workmanship. Provide a minimum mockup area of 100 square feet for each color, unless otherwise approved by the Architect.
 - 5. Represent the standard of quality for the completed Work.
- C. Do not proceed with full-scale exterior painting until mockups have been reviewed and accepted by the Architect and Owner.
- D. Approved mockups may remain as part of the completed Work if undisturbed and acceptable to the Architect and Owner. Remove and replace mockups that are not approved at no additional cost to the Owner.
- E. Acceptance of mockups does not constitute acceptance of deviations from the Contract Documents unless such deviations are specifically approved in writing by the Architect and Owner.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the paint product manufacturer's temperature ranges.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- B. Paints:
 - 1. Sherwin-Williams Company, Basis of Design: www.sherwin-williams.com/#sle.
 - 2. Benjamin Moore & Co.: www.benjaminmoore.com.
 - 3. Rodda Paint Company: www.roddapaint.com/#sle.
- C. Primer Sealers: Same manufacturer as top coats.
- D. Concrete Patching: Ardex: Tilt Wall Patch

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready-mixed, unless required to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is described explicitly in manufacturer's product instructions.
- B. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
- C. Colors: As indicated on drawings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.
- D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Fiber Cement Siding: 12 percent.
 - 2. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
 - 3. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or repair existing paints or finishes that exhibit surface defects.
- D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
- E. Seal surfaces that might cause bleed through or staining of topcoat.
- F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- G. Concrete:
 - 1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
 - 2. Clean concrete according to ASTM D4258. Allow to dry.
 - 3. Patch and finish concrete surfaces as recommended by concrete patching manufacturer.
 - 4. Prepare surface as recommended by top coat manufacturer and in accordance with SSPC-SP 13/NACE No.6.
- H. Fiber Cement Siding: Remove dirt, dust and other foreign matter with a stiff fiber brush. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
- I. Ferrous Metal:
 - 1. Solvent clean according to SSPC-SP 1.

2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
 3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning in accordance with SSPC-SP 6/NACE No.3. Protect from corrosion until coated.
- J. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.
- K. Porcelain Panels: Prior to full application, apply Macropoxy 646 to a representative test area of the existing porcelain substrate and allow it to fully cure. Verify adhesion using ASTM D3359 Cross-Hatch Adhesion Testing or an approved equivalent method. Proceed with full application only after acceptable adhesion has been confirmed.

3.03 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- E. Apply each coat to uniform appearance.
- F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply additional coats until complete hide is achieved.
- G. Sand metal surfaces lightly between coats to achieve required finish.
- H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
- J. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 1. Paint the following work where exposed to view:
 - a. Equipment, including panelboards and switch gear.
 - b. Uninsulated metal piping
 - c. Uninsulated plastic piping
 - d. Pipe hangers and supports
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Ducts

3.04 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

3.06 SCHEDULE - EXTERIOR PAINT SYSTEMS

- A. Exterior Fiber-Cement Siding
 1. Flat Finish.
 - a. Primer: ProBlock Premium All-Purpose Water-Based Interior/Exterior Primer.
 - b. 1st coat: A-100 Exterior Latex Flat, A6 Series.

- c. 2nd coat: A-100 Exterior Latex Flat, A6 Series.
- B. Exterior Ferrous Metals, Existing Sheet Metal Roofing and Sheet Metal Flashing
 - 1. Semi-Gloss Finish.
 - a. Primer: Macropoxy 646 Epoxy.
 - b. 1st coat: Sherloxane 800.
 - c. 2nd coat: Sherloxane 800.
- C. Exterior Ferrous Metals, New and Existing at Other Locations
 - 1. Semi-Gloss Finish.
 - a. Primer: Pro Industrial™ Pro-Cryl Universal Primer, B66-310 Series
 - b. 1st coat: Pro Industrial™ Acrylic Semi-Gloss, B66-650 Series
 - c. 2nd coat: Pro Industrial™ Acrylic Semi-Gloss, B66-650 Series
- D. Exterior Non-Ferrous Metals, New and Existing
 - 1. Semi-Gloss Finish.
 - a. Primer: Pro Industrial™ Pro-Cryl Universal Primer, B66-310 Series
 - b. 1st coat: Pro Industrial™ Acrylic Semi-Gloss, B66-650 Series
 - c. 2nd coat: Pro Industrial™ Acrylic Semi-Gloss, B66-650 Series
- E. Exterior Existing Concrete:
 - 1. Flat Finish:
 - a. Primer: Macropoxy 646 Epoxy.
 - b. 1st coat: Sherloxane 800.
 - c. 2nd coat: Sherloxane 800.
- F. Exterior Existing Porcelain Panel within Aluminum Curtain Walls:
 - 1. Semi-Gloss Finish:
 - a. Primer: Macropoxy 646 Epoxy.
 - b. 1st coat: Sherloxane 800.
 - c. 2nd coat: Sherloxane 800.

END OF SECTION

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SECTION 28 00 00
ELECTRONIC SAFETY AND SECURITY BASIC REQUIREMENTS

PART 1 - GENERAL

1.01 DESIGN-BUILD SUMMARY

- A. Work included in this Section applies to Division 28, Electronic Safety and Security work to provide materials, labor, tools, permits and incidentals to make electronic safety and security 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 Electronic Safety and Security system for this project.
- B. Alternates to this Document may be offered as a separate proposal.

1.03 DESIGN-BUILD APPROACH

- A. Use this Specification 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 CRITERIA

- A. Related Work Specified Elsewhere: Contents of Section apply to Division 28, Electronic Safety and Security Specifications. Requirements of Section are a minimum for Division 28, Electronic Safety and Security Sections, unless otherwise stated in each Section, in which case that Section's requirements take precedence.
- B. Fire Alarm Design Criteria: Refer to Section 28 46 00, Fire Detection and Alarm, for fire alarm system design criteria.
- C. Fire Alarm Equipment: Refer to Section 28 46 00, Fire Detection and Alarm, for fire alarm equipment requirements.

1.05 SECTION INCLUDES

- A. Work included in this Section applies to Division 28, Electronic Safety and Security work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of electronic safety and security 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, installing, 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 having jurisdiction, including local fire marshal, Owner's insurance underwriter, Owner's Authorized Representative, and other reviewing entity whose approval is required to obtain systems acceptance.

1.06 RELATED SECTIONS

- A. Contents of Section apply to Division 28, Electronic Safety and Security 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
- C. Contents of Division 26, Electrical apply to this Section.
- D. Comply with related products/systems requirements for Internet Protocol Communication devices located in Division 27:
 1. Section 27 13 00, Communications Backbone Cabling.
 2. Section 27 15 00, Communications Horizontal Cabling.

1.07 REFERENCES AND STANDARDS

- A. References and Standards per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, individual Division 28, Electronic Safety and Security 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
- C. Reference standards and guidelines include but are not limited to the latest adopted editions from:
 1. ADA - Americans with Disabilities Act
 2. ANSI - American National Standards Institute
 3. ASCE - American Society of Civil Engineers
 4. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers
 5. ASHRAE Guideline 0, the Commissioning Process
 6. ASME - American Society of Mechanical Engineers
 7. ASTM - ASTM International
 8. CFR - Code of Federal Regulations
 9. EPA - Environmental Protection Agency
 10. ETL - Electrical Testing Laboratories
 11. FM - FM Global
 12. ISO - International Organization for Standardization
 13. NEC - National Electric Code
 14. NEMA - National Electrical Manufacturers Association
 15. NFPA - National Fire Protection Association

- 16. OSHA - Occupational Safety and Health Administration
- 17. UL - Underwriters Laboratories Inc.

D. See Division 28, Electronic Safety and Security individual Sections for additional references.

1.08 SUBMITTALS

- A. See Division 01, General Requirements for Submittal Procedures.
- 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 file per division containing one bookmarked PDF file with each bookmark corresponding to each Specification Section. Arrange bookmarks in ascending order of Specification Section number. Individual submittals sent piecemeal in a per Specification Section method will be returned without review or comment. Copy Architect on all transmissions/submissions.
- E. Product Data: Provide manufacturer's descriptive literature for products specified in Division 28, Electronic Safety and Security Sections.
- F. Identify/mark each submittal in detail. Note what difference, 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 items. 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 individual Division 28, Electronic Safety and Security specification Sections for specific items required in product data submittal outside of these requirements.
 - 3. See Division 28, Electronic Safety and Security individual Sections for additional submittal requirements outside of these requirements.
- G. 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.
- H. 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.
- I. 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 7-16 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.

- J. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required per Division 28, Electronic Safety and Security 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.
- K. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.
- L. 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 are 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.
 - 3. Where manufacturer equipment or model numbers are indicated with no exceptions, substitutions will be rejected.
- M. Shop Drawings:
 - 1. Provide coordinated shop drawings which include physical characteristics of all systems, device layout plans, and control wiring diagrams. Reference individual Division 28, Electronic Safety and Security specification Sections for additional requirements for shop drawings outside of these requirements.
 - 2. Provide Shop Drawings indicating access panel locations, size and elevation for approval prior to installation.
- N. Samples: Provide samples when requested by individual Sections.
- O. Resubmission Requirements:
 - 1. Make any corrections or change in submittals when required by Architect/Engineer review comments. 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.
 - 2. Resubmit for review until review indicates no exception taken or "make corrections noted."
 - 3. When submitting drawings for Engineers re-review, clearly indicate changes on drawings and "cloud" any revisions. Submit a list describing each change.
- P. Operation and Maintenance Manuals, Owner's Instructions:
 - 1. Reference individual Division 28, Electronic Safety and Security Specification Sections for additional requirements for operations and maintenance manuals.
 - 2. Submit, at one time, electronic files (PDF format) 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.
 - a. 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.

- b. 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.
 - c. Include copy of complete parts list for equipment. Include available exploded views of assemblies and sub-assemblies.
 - d. Include Warranty per Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 28, Electronic Safety and Security Sections.
 - e. Include product certificates of warranties and guarantees.
 - f. Include copy of start-up and test reports specific to each piece of equipment.
 - g. Include commissioning reports.
 - h. Engineer will return incomplete documentation without review.
 - i. Engineer will provide one set of review comments in Submittal Review format. Arrange for additional reviews; bear costs for additional reviews at Engineer's hourly rates.
- 3. 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 28 00 00, Electronic Safety and Security Basic Requirements Article titled "Demonstration."
 - 4. 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.
- Q. 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 and location of concealed items. Include items changed by addenda, field orders, supplemental instructions, and constructed conditions.
 - 2. Record Drawings are to include equipment locations, calculations, and schedules that accurately reflect "as constructed or installed" for project.
 - 3. At completion of project, input changes to original project Revit Model and make one set of black-line drawings created from Revit model in version/release equal to contract drawings. Submit Revit model and drawings upon substantial completion.
 - 4. See Division 28, Electronic Safety and Security individual Sections for additional items to include in Record Drawings.

1.09 QUALITY ASSURANCE

- A. Regulatory Requirements: Work and materials installed to conform with all local, State and Federal codes, and other applicable laws and regulations. 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.
- B. 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.

- C. 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 (e.g. cable tray, panels, 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.
- D. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect in writing before starting work.
- E. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.
- F. 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, Division 01, General Requirements, and individual Division 28, Electronic Safety and Security 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, plumbing, cable trays, lights, and electrical services with architectural and structural requirements, and other trades (including 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.
- B. Advise Architect in 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, and clearances of 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.
- D. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

1.12 OWNER-DESIGNATED SECURITY AND FIRE ALARM CONTRACTOR

- A. The Owner has designated a preferred electronic safety and security systems contractor (hereafter referred to as the Owner Designated Integrator) for all Access Control, Video Surveillance, Intrusion Detection, and Fire Alarm system work.
 - 1. Owner Designated Integrator for Fire Alarm is First Response.
 - 2. Owner Designated Integrator for Security is Point Monitor.
- B. All work specified in Division 28, including but not limited to system design, programming, installation, terminations, testing, commissioning, training, modifications, to existing systems, and warranty service shall be performed by the Owner Designated Integrator unless noted otherwise in Technology Responsibility Matrix.
- C. The General Contractor shall carry the Owner Designated Integrator as a subcontractor and shall coordinate all scheduling, access, rough-in requirements, and construction activities necessary for completion of the work.
- D. No substitutions of the Owner Designated Integrator will be permitted without written approval from the Owner.

- E. Where Division 28 systems interface with Division 08, Division 26, Division 27, Division 23, or other trades, those trades shall provide rough-in, pathways, power, supports, device mounting provisions, and interface connections as indicated in the Contract Documents. Final device installation, terminations, programming, startup, testing, and commissioning shall be performed by the Owner Designated Integrator.
- F. Fire alarm programming, modifications to the existing fire alarm system, final acceptance testing, AHJ Coordination, and Certification shall be performed only by the Owner Designated Integrator and in accordance with the requirements of the existing fire alarm manufacturer.

(Added by Addendum 2)

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Articles, fixtures, and equipment of a kind to be standard product of one manufacturer, including but not limited to panels, devices and equipment unless otherwise specified in individual Division 28, Electronic Safety and Security Sections.

2.02 STANDARDS OF MATERIALS AND WORKMANSHIP

- 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, or FM listed and labeled or be approved by State, County, and City authorities prior to procurement and installation.
- B. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.
- C. 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, and individual Division 28, Electronic Safety and Security Sections.
- B. Install equipment having components requiring access (i.e., devices, equipment, electrical boxes, panels, 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 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.
 - 2. In absence of specific requirements, comply with individual Division 28, Electronic Safety and Security 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 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.
 - 2. In absence of specific requirements, comply with individual Division 28, Electronic Safety and Security Sections and coordinate location and protection level of fire and/or smoke rated walls, ceilings, and floors. When these assemblies are penetrated, seal around conduit, raceway 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: In plenums, provide plenum rated materials that meet the requirements to be installed in plenums.

3.02 SEISMIC CONTROL

- A. Confirm Seismic Control requirements in Division 01, General Requirements, Structural documents, and individual Division 28 Electronic Safety and Security Sections.
- B. Earthquake resistant designs for Electronic Safety and Security (Division 28) equipment to conform to regulations of jurisdiction having authority.
- C. 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.
- D. Provide means to prohibit excessive motion of safety and security 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, and individual Division 28, Electronic Safety and Security 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 and wire installation prior to backfilling.
 - 2. Prior to covering walls when electrical, safety and security systems installation is started.
 - 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: 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.
- B. In absence of specific requirements in Division 01, General Requirements, comply with individual Division 28, Electronic Safety and Security 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 system, verify that every item is thoroughly prepared. Install new 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. 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 00, Procurement and Contracting Requirements and Division 01, General Requirements.
- B. In absence of specific requirements, comply with individual Division 28, Electronic Safety and Security 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 walks, repair, refinish and leave 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.
- B. In absence of specific requirements, comply with the individual Division 28, Electronic Safety and Security 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.
 2. Protect equipment and pipe 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 devices, panels and similar items until in service.
 4. 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.

3.08 DEMONSTRATION

- A. Confirm Demonstration requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 28, Electronic Safety and Security Sections.
- B. Upon completion of work and adjustment of equipment, test systems, demonstrate to Owner's Authorized 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 Staff as specified in Division 01, General Requirements, and individual Division 28, Electronic Safety and Security Sections.
- C. Manufacturer's Field Services: Furnish services of a qualified factory certified instructor 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, and individual Division 28, Electronic Safety and Security 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, and individual Division 28, Electronic Safety and Security Sections.
- B. Install equipment in accordance with manufacturer's installation instructions, plumb and level and firmly anchored to building structure. 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 required for installation of equipment, conduit and wiring.

3.11 PAINTING

- A. Confirm Painting requirements in Division 01, General Requirements and Division 09, Finishes.
- B. In absence of specific requirements, comply with individual Division 28, Electronic Safety and Security 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, with one coat of black asphalt varnish for exterior or black enamel for interior, suitable for hot surfaces.
 - 2. In electrical and mechanical 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 conduit exposed in finished areas with two coats paint suitable for metallic surfaces. Color selected by Architect.

3.12 DEMOLITION

- A. Confirm requirements in Division 01, General Requirements and Division 02, Existing Conditions.

- B. In the absence of specific requirements, comply with individual Division 28, Electronic Safety and Security Sections and the following:
1. Scope:
 - a. It is the intent of these documents to provide necessary information and adjustments to electronic safety and security system required to meet code, and accommodate installation of new work.
 - b. Existing Conditions: Determine exact location of existing utilities and equipment before commencing work, compensate Owner for damages caused by failure to exactly locate and preserve underground utilities. Replace damaged items with new material to match existing. Promptly notify Owner if utilities are found which are not shown on Drawings.
 - c. Coordinate with Owner so that work can be scheduled not to interrupt operations, normal activities, building access, access to different areas. Owner will cooperate to best of their ability to assist in coordinated schedule, but will remain final authority as to time of work permitted.
 2. Examination:
 - a. Determine exact location of existing utilities and equipment before commencing work, compensate Owner for damages caused by failure to locate and preserve utilities. Replace damaged items with new material to match existing.
 - b. Verify that abandoned wiring and equipment serve only abandoned facilities.
 - c. Report discrepancies to Architect before disturbing existing installation.
 3. Promptly notify Owner if systems are found which are not shown on Drawings.
 4. Execution:
 - a. Remove existing safety and security equipment, devices and associated wiring from walls, ceilings, floors, and other surfaces scheduled for remodeling, relocation, or demolition unless shown as retained or relocated on Drawings.
 - b. Provide temporary wiring and connections to maintain electrical continuity of existing systems during construction. Remove or relocate electrical boxes, conduit, wiring and equipment as encountered in removed or remodeled areas in existing construction affected by this work.
 - c. Remove and restore wiring which serves usable existing outlets clear of construction or demolition.
 - d. If existing junction boxes will be made inaccessible, or if abandoned outlets serve as feed through boxes for other existing electrical equipment which is being retained, provide new conduit and wire to bypass abandoned outlets.
 - e. If existing conduits pass through partitions or ceiling which are being removed or remodeled, provide new conduit and wire to reroute clear of construction or demolition and maintain service to existing load.
 - f. Extend circuiting and devices in existing walls to be furred out.
 - g. Remove abandoned wiring to source of supply.
 - h. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
 - i. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
 - j. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.
 - k. Remove abandoned wiring to leave site clean.
 - l. If existing electrical equipment contains PCBs (Polychlorinated Biphenyl), replace with new non-PCB equipment. Dispose of material containing PCBs as required by federal and local regulations.
 - m. Repair adjacent construction and finishes damaged during demolition work.
 - n. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

- C. Existing Fire Alarm System: Maintain existing system in service during construction. Disable system only to make switchovers and connections.
 - 1. Notify Owner before partially or completely disabling system.
 - 2. Notify local fire service.
 - 3. Make notifications at least five working days in advance.
 - 4. Make temporary connections to maintain service in areas adjacent to work area.
- D. Existing Security Systems: Maintain existing systems in service until new system is complete and ready for service. Disable system only to make switchovers and connections.
 - 1. Notify Owner at least five working days before partially or completely disabling system.
 - 2. Make temporary connections to maintain service in areas adjacent to work area.

3.13 ACCEPTANCE

- A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.
- B. In absence of specific requirements, comply with individual Division 28, Electronic Safety and Security Sections. 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:
 - 1. Cleaning
 - 2. Operation and Maintenance Manuals
 - 3. Training of Operating Personnel
 - 4. Record Drawings
 - 5. Warranty and Guaranty Certificates
 - 6. Start-up/Test Documents and Commissioning Reports

3.14 FIELD QUALITY CONTROL

- A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.
- B. In absence of specific requirements, comply with individual Division 28, Electronic Safety and Security Sections and conduct the following 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 Closeout Documents.
 - 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 in the letter that electronic safety and security systems were installed in accordance with manufacturer's recommendations, UL listings and FM Global approvals.
- B. Include Letter of Conformance, copies of manufacturers' warranties and extended warranties in operating and maintenance manuals.

END OF SECTION

SECTION 28 14 00
ACCESS CONTROL SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

- A. Work included:
 - 1. Access Control Software
 - 2. Access Control Panels
 - 3. Access Control Credentials
 - 4. Card Readers
 - 5. Door Position Sensors
 - 6. Exit Devices
 - 7. Power Supply
 - 8. Remote Door Release Buttons
 - 9. Cabling
 - 10. Electronic Locks and Strikes (Provided by Division 08)
 - 11. Magnetic Locks (Provided by Division 08)

1.02 RELATED SECTION

- A. Contents of Section 28 00 00, Electronic Safety and Security Basic Requirements and Division 01, General Requirements apply to this Section.
- B. In addition, reference the following:
 - 1. Section 08 71 00, Door Hardware (by others)
 - 2. Section 27 15 00, Communications Horizontal Cabling
 - 3. Section 28 20 00, Video Surveillance System
 - 4. Section 28 31 00, Intrusion Detection System

1.03 REFERENCES AND STANDARDS

- A. References and Standards as required by Section 28 00 00, Electronic Safety and Security Basic Requirements and Division 01, General Requirements.
- B. Adhere to the most recent published edition of codes, rules, regulations, standards, manufacturer's instructions, or requirements of regulatory agencies as of the contract date. Promptly notify telecom engineer of any discrepancies between construction documents or conditions and the stipulated codes, standards, guidelines, and specifications. In case of conflicts, the more stringent requirement must take precedence.
- C. In addition, meet the following:
 - 1. Provide system wiring in accordance with good engineering practices as established by the Telecommunications Industry Association (TIA), the National Electrical Code (NEC), and the Building Industry Consulting Services International (BICSI).
- D. Abbreviations and Acronyms:
 - 1. ACS – Access Control System
 - 2. BLE – Bluetooth Low Energy
 - 3. BMS – Building Management System
 - 4. CCTV – Closed Circuit Television
 - 5. DPDT – Double Pole Double Throw
 - 6. IDS – Intrusion Detection System
 - 7. NFC – Near Field Communication
 - 8. OSDP – Open Supervised Device Protocol
 - 9. PIN – Personal Identification Number
 - 10. SPDT – Single Pole Double Throw

1.04 SUBMITTALS

- A. Submittals as required by Section 28 00 00, Electronic Safety and Security Basic Requirements, and Division 01, General Requirements.
- B. Work must not begin until shop drawings and submittals are approved.
 - 1. The intent of submitting shop drawings and submittals for approval is for contractors to display a conceptual understanding of the Construction Documents.
- C. Contractors must request drawing backgrounds from the Architect and create shop drawings using their own Titleblock. Shop drawings that copy construction documents will be rejected.
- D. Submittals and Shop Drawings must be approved four weeks prior to ordering products.
- E. In addition, provide:
 - 1. Product Data Cut Sheets:
 - a. Provide manufacturer's cut sheets with a red arrow and highlighted part numbers even if cut sheet has only one part number associated.
 - 2. Shop Drawings that include, but are not limited to the following:
 - a. Access Control Panel wall elevations
 - b. Device locations on floor plans
 - c. Cable pathways and routing
 - d. Installation details
 - e. Point-to-point list and wiring details
- F. Submittal Requirements at Closeout:
 - 1. Provide as-built drawings with panel layouts, rack elevations, and device locations with labeling.
- G. Substitutions:
 - 1. Substitutions must conform to the general requirements as outlined in Section 28 00 00, Electronic Safety and Security Basic Requirements.

1.05 QUALITY ASSURANCE

- A. Quality assurance as required by Section 28 00 00, Electronic Safety and Security Basic Requirements and Division 01, General Requirements.
- B. Pre-Construction Meeting:
 - 1. Contractor must initiate a virtual or on-site pre-construction meeting to discuss installation procedures.
- C. ~~Installer Qualifications:~~
 - 1. ~~Contractor specializing in performing work of this section with a minimum of three years documented experience.~~
 - 2. ~~Contractor must be certified by the manufacturer to install the design components.~~ (Deleted by Addendum 2)
- D. **Work shall be performed by the Owner Designated Integrator.**
 - 1. **Owner Designated Integrator: Point Monitor.**
 - 2. **No substitutions permitted.** (Added by Addendum 2)
- E. Regulatory Requirements:
 - 1. Installation must comply with applicable building codes and regulations.

1.06 WARRANTY

- A. Warranty of materials and workmanship as required by Section 28 00 00, Electronic Safety and Security Basic Requirements and Division 01, General Requirements.
- B. The contractor's warranty of the physical installation must be valid for a period of no less than 1 year.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Access Control Software:
 - 1. Brivo
 - 2. No substitutions
- B. Access Control Panels:
 - 1. Brivo
 - 2. No substitutions
- C. Access Control Credentials:
 - 1. HID Global
 - 2. Or engineer approved equivalent
- D. Card Readers:
 - 1. Brivo
 - 2. No substitutions
- E. Door Position Sensors:
 - 1. Interlogix
 - 2. Nascom
 - 3. Or engineer approved equivalent
- F. Exit Devices:
 - 1. REX PIR Sensor:
 - a. Bosch
 - b. Honeywell
 - c. STI
 - d. Or engineer approved equivalent
 - 2. Push-to-Exit Buttons:
 - a. Adams Rite
 - b. Camden Door Controls
 - c. Dortronics
 - d. Or engineer approved equivalent
 - 3. Touchless Sensors:
 - a. Camden Door Controls
 - b. Dortronics
 - c. Or engineer approved equivalent
- G. Power Supply:
 - 1. Altronix
 - 2. Or engineer approved equivalent
- H. Remote Door Release Buttons:
 - 1. Camden Door Controls
 - 2. Dortronics
 - 3. Or engineer approved equivalent
- I. Cabling:
 - 1. West Penn Wire
 - 2. IP cabling to match Division 27, Communications
 - 3. Or engineer approved equivalent
- J. Electronic Locks and Strikes:
 - 1. Provided by Section 08 71 00, Door Hardware
- K. Magnetic Locks:
 - 1. Provided by Section 08 71 00, Door Hardware

2.02 ACCESS CONTROL SOFTWARE

- A. ACS software is essential for maintaining security, compliance, and efficient management of physical access across an organization's infrastructure.
- B. System Type:
 - 1. Cloud-based
- C. User Interface:
 - 1. Browser-based
- D. Mobile Compatibility:
 - 1. Mobile Application for administrators and users.
- E. Integration Capabilities:
 - 1. Must integrate with existing ACS hardware and components.
 - 2. Interoperability with other systems such as CCTV, IDS, and BMS.
- F. User Management:
 - 1. Ability to add, modify, and remove user profiles, access levels, and credentials.
 - 2. Live monitoring and logging of access points, with alerts for unauthorized access attempts.
 - 3. Generate audit trails, usage reports, and compliance data, exportable in multiple formats (PDF, CSV).
- G. Cybersecurity and Data Protection:
 - 1. Minimum of AES-256 encryption for data at rest and in transit.
 - 2. Support for multi-factor authentication (MFA) for administrator login.
 - 3. Compliance with data privacy regulations (e.g., GDPR) and local regulatory requirements.
- H. Hardware and Network Requirements:
 - 1. Provide minimum CPU, RAM, and storage capacity based on system size.
 - 2. Provide regular automatic backups and disaster recovery options.

2.03 ACCESS CONTROL PANELS

- A. Main Control Panel (Central Controller):
 - 1. Functionality:
 - a. A central hub of the ACS, managing communication between connected devices (e.g., door panels, card readers, biometric scanners) and the access control software.
 - 2. Communication Protocols:
 - a. Support for standard protocols (e.g., TCP/IP, RS-485), with capability for secure remote management over the network.
 - 3. Integration Compatibility:
 - a. Compatible with CCTV, alarm systems, intrusion detection, and building management systems.
 - 4. Power Supply:
 - a. Supports 12V DC or 24V DC power input, with battery backup options to maintain functionality during power outages.
 - 5. Environmental Standards:
 - a. Operating temperature range of -4 degrees F to 140 degrees F and minimum IP65 rating for rugged environments if mounted in outdoor enclosures.
- B. Door Control Panel (Distributed Controller):
 - 1. Functionality:
 - a. A sub-panel within the ACS that manages access to a specific entry point (e.g., a door or gate).
 - 2. Credential Verification:
 - a. Interfaces with local readers to verify user credentials. Upon a valid request, it signals the locking mechanism to unlock the door.
 - 3. Real-Time Status Reporting:

- a. Sends door status updates (e.g., locked/unlocked, door held open, or forced entry) back to the main control panel and software.
- 4. Local Storage:
 - a. Door panels have local storage to retain recent access data, allowing continued operation if the main control panel temporarily disconnects.
- 5. Power for Lock Mechanisms:
 - a. Supplies power to door locks, mag-locks, or electric strikes, controlling access based on authorized signals.

2.04 ACCESS CONTROL CREDENTIALS

- A. A form of identification used by an access control system to authenticate and authorize individuals for entry into restricted areas. Credentials are issued to users and can take various forms, including physical items like key cards, proximity cards, smart cards, or fobs, as well as digital options like mobile credentials on smartphones.
- B. Types:
 - 1. Physical Credentials:
 - a. Proximity Cards:
 - 1) Match existing
- C. Security and Data Protection:
 - 1. Encryption:
 - a. Credentials must use AES-128 or higher encryption, with secure, non-reversible storage of data on physical and mobile credentials.
 - 2. Anti-Counterfeit Features:
 - a. Include secure elements, such as unique ID numbers, holograms, or laser-etched identifiers for physical credentials to prevent unauthorized duplication.
 - 3. Data Retention:
 - a. Data retention and deletion protocols for mobile or digital credentials should comply with local data privacy and security regulations relevant to the project requirements within the United States.

2.05 CARD READERS

- A. A device used to read and authenticate access control credentials, such as proximity cards, smart cards, or mobile credentials, to permit or deny entry to secured areas.
- B. Types:
 - 1. Proximity Card Readers:
 - a. Match existing

2.06 DOOR POSITION SENSORS

- A. A device used to monitor and detect the open or closed status of a door.
- B. Types:
 - 1. Magnetic Contact Sensors
 - 2. Reed Switch Sensors
 - 3. Electromechanical Sensors
 - 4. Integrated Door and Lock Sensors
- C. Contact Configurations:
 - 1. SPDT
 - 2. DPDT

2.07 EXIT DEVICES

- A. A device used to detect when a person is about to exit a secured area and to unlock the door for easy egress.
- B. Types:
 - 1. Request-To-Exit (REX) PIR Sensor:

- a. Application:
 - 1) Detects motion in the exit direction, triggering the ACS to allow egress without user interaction.
- b. Range:
 - 1) Adjustable up to 15 feet with a detection angle of 90 degrees to 110 degrees.
- c. Tamper Detection:
 - 1) Alert ACS if the sensor is tampered with or disabled.
- d. Environment:
 - 1) Indoor/Outdoor
- 2. Push-To-Exit Buttons:
 - a. Application:
 - 1) Manual egress request by pressing a button, signaling the ACS to unlock or release the door.
 - b. Mount:
 - 1) Surface
 - 2) Flush
 - c. Environment:
 - 1) Indoor/Outdoor
- 3. Mechanical Request-To-Exit Bars:
 - a. Mechanical push bar as part of door hardware (Provided by Division 08 71 00, Door Hardware)

2.08 POWER SUPPLY

- A. Match Existing

2.09 REMOTE DOOR RELEASE BUTTONS

- A. A device that allows authorized personnel to unlock or open a secured door from a remote location, typically without the need for an individual at the door to present a credential.
- B. Integrates with ACS, ensuring that action is logged, and permissions are verified. This allows for a secure yet flexible entry solution.
- C. Mount:
 - 1. Wall
 - 2. Desktop
 - 3. Underside of desk

2.10 CABLING

- A. Cabling used to connect access control system components, ensuring reliable signal transmission for sensors, card readers, and exit devices.
- B. Copper:
 - 1. Power:
 - a. 18 AWG, 2 pair, UTP
 - 2. RS-232:
 - a. 18 AWG, 4 Conductor, Shielded
 - 3. IP Cabling:
 - a. Match Division 27, Communications
- C. Connectors:
 - 1. Modular connector
 - 2. 24 V Power: Screw-down on spade lug
- D. Indicate any additional wiring required by the manufacturer's installation instructions on the submittal drawings and diagrams.
- E. Cabling must be plenum-rated where required. Contractor must obtain clarification from Authority Having Jurisdiction (AHJ) if any uncertainty exists.

2.11 ELECTRONIC LOCKS AND STRIKES

- A. Provided by Section 08 71 00, Door Hardware.

2.12 MAGNETIC LOCKS

- A. Provided by Section 08 71 00, Door Hardware.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

- A. Install equipment in compliance with manufacturer's guidelines, NEC, and local codes.
- B. Coordinate installation locations with drawings and related trades to avoid conflicts.
- C. Ensure equipment is installed in secure locations and protected from physical damage, tampering, or unauthorized access.
- D. Label all cables, wiring, and devices for identification and troubleshooting.
- E. Mount devices securely to designated surfaces, ensuring stability and alignment with accessibility requirements.
- F. Conduct installation without obstructing normal access paths or violating ADA compliance.
- G. Perform work with minimal disruption to other operations within the facility.
- H. Provide a minimum of 0.75-inch conduit to each security device.
- I. Provide the following training to system users to ensure a comprehensive understanding of Access Control System operations, minimizing potential operational errors:
 - 1. Training Requirements:
 - a. Conduct a total of eight hours of operational training and two hours of maintenance training. Training sessions must be conducted as hands-on seminars at Owner's facility.
 - b. Provide Owner with manufacturer's operating instructions and documentation.
 - 2. Instructors:
 - a. Supply factory-trained representatives to instruct Owner's personnel in the operation and maintenance of ACS equipment.
 - 3. Training Documentation:
 - a. Submit a detailed training plan and checklist to Owner's Authorized Representative two weeks prior to scheduled training, in accordance with manufacturer's guidelines.
 - 4. Training Scope:
 - a. Provide comprehensive instruction for Owner's Authorized Representative, covering operation, maintenance, and troubleshooting of the ACS.
 - 5. System Operation and Demonstration:
 - a. Security integrator/contractor must thoroughly explain and demonstrate system operation, including software functions, remote access capabilities, programming procedures, priority level configuration, monitoring station use, and system override functions.
- J. Quality of work:
 - 1. Comply with industry standards unless specified requirements indicate more stringent standards or more precise quality of work.
 - 2. Contractor/integrator must be a certified installer for the selected manufacturer(s) prior to, during, and throughout the completion of the system installation and must be able to provide the manufacturer's extended warranty.
 - 3. Maintain quality control over all suppliers and subcontractors to ensure adherence to project specifications.
- K. Equipment Pretest:
 - 1. Bench test equipment prior to delivery to job site and before installation, in accordance with the manufacturer's installation instructions.
- L. Fire Rated Doors and Frames:

1. Do not modify any Fire-rated door or frame in a way that would void its UL Listing or fire rating.
- M. Bonding:
 1. Bond equipment to an earth-ground in accordance with manufacturer's requirements for ACS systems.
 2. Connect earth-ground to a dedicated ground rod or an approved cold-water pipe
 3. Do not use electrical system grounds or telephone grounds for earth-ground connections.
 4. Do not use mounting posts or building structural steel as earth-ground connections.
- N. Cutting and Patching:
 1. Perform cutting, fitting, or patching as required to complete the work.

3.02 ACCESS CONTROL SOFTWARE

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.
- C. Ensure software compatibility with network infrastructure and confirm necessary software licenses.
- D. Configure user access levels and permissions as specified by project requirements.
- E. Test software functionalities, including remote access, reporting, and data logging.

3.03 ACCESS CONTROL PANELS

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.
- C. Mount access control panels in secure, accessible locations where shown on drawings.
- D. Connect access control panels to power supplies, communication networks, and access control devices according to manufacturer's guidelines.
- E. Ensure each panel is grounded according to Division 26 for grounding and bonding.
- F. Test each panel to confirm accurate response to input from connected devices and successful communication with access control software.

3.04 ACCESS CONTROL CREDENTIALS

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.
- C. Program access control credentials, including key cards, fobs, or mobile credentials, per project access requirements.
- D. Verify compatibility of credentials with all card readers and other access points.
- E. Enable encryption and data security settings for credentials.
- F. Test credentials to ensure functionality and verify appropriate access permissions.

3.05 CARD READERS

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.
- C. Install card readers where shown on drawings, ensuring secure and tamper-resistant mounting.
- D. Connect each card reader to the ACS panels using manufacturer-suggested cabling.
- E. Confirm compatibility with access control credentials and test each reader to verify proper function.

3.06 DOOR POSITION SENSORS

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.

- C. Install door position sensors on specified doors to monitor open/closed status, integrating with ACS to provide real-time monitoring.
- D. Connect sensors to access control panels, ensuring alignment and unobstructed operation of doors.
- E. Test each sensor to verify accurate status reporting in the access control software.

3.07 EXIT DEVICES

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.
- C. Ensure compliance with local fire and life safety codes to allow easy and safe egress.
- D. Integrate exit devices with ACS to allow remote unlocking or secure re-entry control as specified.
- E. Test each exit device to verify smooth operation, functionality with ACS, and compliance with egress requirements.

3.08 POWER SUPPLY

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.
- C. Mount power supplies ensuring accessibility for maintenance and inspection.
- D. Connect power supplies to ACS components and ensure NEC compliant wiring and grounding.
- E. Size power supplies to include 20% additional capacity for potential future devices.
- F. Test each power supply unit for correct voltage output, battery backup functionality, and proper operation with connected devices.

3.09 REMOTE DOOR RELEASE BUTTONS

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.
- C. Install remote door release buttons at designated locations, ensuring compliance with ADA requirements where applicable.
- D. Connect each button to the ACS for remote door release functionality, ensuring secure wiring connections.
- E. Test each button to confirm proper operation and verify that LED status indicators, if applicable, are functioning correctly.

3.10 CABLING

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.
- C. Route cabling for ACS components according to local codes and standards in designated cable pathways to ensure protection and signal integrity.
- D. Secure and protect cabling from physical damage, electromagnetic interference, and unauthorized access.
- E. Terminate cables according to manufacturer instructions and label each end for easy identification.
- F. Test all cabling for continuity, signal quality, and reliability.

3.11 ELECTRONIC LOCKS AND STRIKES

- A. Provided by Section 08 71 00, Door Hardware.

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3.12 MAGNETIC LOCKS

A. Provided by Section 08 71 00, Door Hardware.

END OF SECTION

SECTION 28 20 00
VIDEO SURVEILLANCE SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Included:
 - 1. Video Management System
 - 2. Video Recording System
 - 3. Cameras and Lenses
 - 4. Camera Enclosures and Mounts
 - 5. Cable, Wire and Accessories

1.02 RELATED

- A. Contents of Division 28, Electronic Safety and Security and Division 01, General Requirements apply to this Section.
- B. In addition, reference the following:
 - 1. Section 27 05 28, Pathways for Communications Systems
 - 2. Section 27 05 33, Conduits and Backboxes for Communications Systems
 - 3. Section 27 11 00, Communications Equipment Room Fittings
 - 4. Section 27 15 00, Communications Horizontal Cabling

1.03 REFERENCES AND STANDARDS

- A. References and Standards as required by Section 28 00 00, Electronic Safety and Security Basic Requirements and Division 01, General Requirements.
- B. Adhere to the most recent published edition of codes, rules, regulations, standards, manufacturer's instructions, or requirements of regulatory agencies as of the contract date. Promptly notify telecom engineer of any discrepancies between construction documents or conditions and the stipulated codes, standards, guidelines, and specifications. In case of conflicts, the more stringent requirement must take precedence.
- C. In addition, meet the following:
 - 1. Provide system wiring in accordance with good engineering practices as established by the Telecommunications Industry Association (TIA), the National Electrical Code (NEC), and the Building Industry Consulting Services International (BICSI).
- D. Abbreviations and Acronyms:
 - 1. ACS – Access Control System
 - 2. CCTV – Closed Circuit Television
 - 3. IDS – Intrusion Detection System
 - 4. LAN – Local Area Network
 - 5. PTZ – Pan, Tilt, Zoom
 - 6. PC – Personal Computer
 - 7. WAN – Wide Area Network

1.04 SUBMITTALS

- A. Submittals as required by Division 28, Electronic Safety and Security and Division 01, General Requirements.
- B. Work must not begin until shop drawings and submittals are approved.
 - 1. The intent of submitting shop drawings and submittals for approval is for contractors to display a conceptual understanding of the Construction Documents.
- C. Contractors must request drawing backgrounds from the Architect and create shop drawings using their own Titleblock. Shop drawings that copy construction documents will be rejected.
- D. Submittals and Shop Drawings must be approved four weeks prior to ordering products.
- E. In addition, provide:

1. Product Data Cut Sheets:
 - a. Provide manufacturer's cut sheets with a red arrow and highlighted part numbers even if cut sheet has only one part number associated.
2. Shop Drawings that include, but are not limited to the following:
 - a. Video Surveillance System Equipment Rack Elevations
 - b. Device locations on floor plans
 - c. Camera and Mount Schedules
 - d. Cable pathways and routing
 - e. Installation Details
- F. Submittal Requirements at Closeout:
 1. Provide as-built drawings with panel layouts, rack elevations, and camera locations with labeling.
- G. Substitutions:
 1. Substitutions must conform to the general requirements as outlined in Section 28 00 00, Electronic Safety and Security Basic Requirements.

1.05 QUALITY ASSURANCE

- A. Quality assurance as required by Section 28 00 00, Electronic Safety and Security Basic Requirements and Division 01, General Requirements.
- B. Pre-Construction Meeting:
 1. Contractor must initiate a virtual or on-site pre-construction meeting to discuss installation procedures.
- C. ~~Installer Qualifications:~~
 1. ~~Contractor specializing in performing work of this section with a minimum of three years documented experience.~~
 2. ~~Contractor must be certified by the manufacturer to install the design components.~~ (Deleted by Addendum 2)
- D. Work shall be performed by the Owner Designated Integrator.
 1. Owner Designated Integrator: Point Monitor.
 2. No substitutions permitted. (Added by Addendum 2)
- E. Regulatory Requirements:
 1. Installation must comply with applicable building codes and regulations.

1.06 WARRANTY

- A. Warranty of materials and workmanship as required by Section 28 00 00, Electronic Safety and Security Basic Requirements and Division 01, General Requirements.
- B. The contractor's warranty of the physical installation must be valid for a period of no less than 1 year.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Video Management System:
 1. Match Existing
- B. Video Recording System:
 1. Match Existing
- C. Cameras and Lenses:
 1. Match Existing
- D. Camera Enclosures and Mounts:
 1. Match Existing
- E. Cable, Wire and Accessories:
 1. West Penn Wire

2. Or approved equivalent.

2.02 VIDEO MANAGEMENT SYSTEM

- A. A Video Management System (VMS) is software designed to manage video surveillance systems. It facilitates the capture, storage, and analysis of video data from connected cameras and recording devices.
- B. A VMS is not required if ACS indicated in Section 28 14 00, Access Control System and Section 28 31 00, Intrusion Detection System, is capable of VMS required functions listed below.
- C. Provide a video management system with the following:
 1. Provide scalable video surveillance solution accommodating required number of cameras for project, allowing incremental additions on unit-by-unit basis.
 2. Ensure compatibility with video streams from Internet Protocol (IP) cameras, capable of digital encoding in MPEG-4, MPEG-2, MJPEG, H.264, Wavelet, or JPEG2000 compression formats, and support simultaneous real-time recording.
 3. Integrate seamlessly with IP cameras from various manufacturers.
 4. Configure each camera's bit rate, frame rate, and resolution independently, ensuring changes to one camera do not affect recording and display settings of other cameras in system.
 5. Utilize non-proprietary recording hardware without hardware multiplexers or time-division technology for video or audio recording and monitoring.
 6. Implement open architecture permitting use of non-proprietary PC storage hardware, allowing unlimited storage capacity and scalable upgrades.
 7. Support operation of system cameras, including pan, tilt, and zoom functionalities, using multiple CCTV keyboards, regardless of camera brand.
 8. Enable users to control live viewing functions, camera switching, and automation operations via standard PC keyboard.
 9. Digitally sign recorded video with 248-bit RSA public/private key cryptography, with user-configurable encryption keys.
 10. Ensure encrypted control channels using Secure Sockets Layer (SSL).
 11. Incorporate server software modules (SSM) and client software applications (CSA).
 12. Allow installation of SSM and CSA on same workstation or separate workstations as needed.

2.03 VIDEO RECORDING SYSTEM

- A. A Video Recording System is designed to capture, store, and manage video footage from surveillance cameras. It typically consists of hardware and software components that work together to ensure video data is recorded, stored, and accessible for monitoring and review.
- B. Network Video Recorder (NVR):
 1. System must support an integrated IP-capable digital video management recording solution (software) with the following features and capabilities:
 - a. Seamless integration with overall security system.
 - b. Use of IP-based camera hardware for live surveillance viewing through network, with ability to configure, view, and administer each camera individually.
 - c. Modular architecture capable of supporting unlimited number of cameras.
 - d. Ability to record and display live and recorded video simultaneously.
 - e. Support for both event-based and continuous recording.
 - f. Video events linked to system events within a unified system database; only a single database accepted for this interface.
 - g. Independent camera setup for:
 - 1) Compression rate.
 - 2) Brightness.
 - 3) Contrast.
 - 4) Additional factory requirements.

- h. Network interface enabling remote access to NVR from any location on end user's LAN/WAN.
- i. Capability to playback stored video over LAN/WAN with network bandwidth usage not exceeding 2 Mbps per digital video server.
- j. Real-time association of any alarm/event in system with digital video clip.
- k. Support for user-defined pre- and post-recording settings.
- l. CCTV PTZ control via system video interface when PTZ cameras are present.
- m. Advanced matrix view support for on-line cameras, allowing up to 16 channels to be displayed simultaneously in video matrix, with any combination of live and recorded video.
- n. Security Integrator/Contractor must coordinate server configuration requirements directly with Owner.

2.04 CAMERAS AND LENSES

- A. Cameras and lenses are essential components of a video surveillance system, designed to capture and transmit high-quality video footage for monitoring and security purposes. Cameras come in several types, such as fixed, PTZ, and multi-sensor models, each tailored to specific surveillance needs.
- B. IP cameras must have the following capabilities and functions:
 - 1. Camera must be IEEE 802.3at compliant. IP cameras to only be utilized as part of CCTV Network and should not be integrated with standard analog or digital CCTV System equipment.
 - 2. Category 6A cable must be primary medium for carrying signals up to 300 feet from network device. If any camera is installed greater than 300 feet from controlling device, the following is required:
 - a. Provide local or remote 12 VDC or 24 VAC power source required from Class 2, UL compliant power supply. Provide signal converter required to convert from Category cable to optical fiber. Signal to be converted back to Category cable at converter at controlling device.
 - b. Extended distance Category 6A cabling.
 - 3. Have both an IP output and monitor output producing picture equivalent to analog camera and allowing simultaneous output of both.
 - 4. Have programmable IP address allowing installation of multiple units in same Local Area Network (LAN) environment.
 - 5. Incorporate minimum of Transmission Control Protocol (TCP)/IP, User Datagram Protocol (UDP), Hypertext Transfer Protocol (HTTP), File Transfer Protocol (FTP), Internet Control Message Protocol (ICMP), Address Resolution Protocol (ARP), Real-Time Transport Protocol (RTP), Dynamic Host Configuration Protocol (DHCP), Network Time Protocol (NTP), Simple Mail Transfer Protocol (SMTP), Internet Group Management Protocol (IGMP), and Differentiated Service Code Point (DSCP) protocols for various network applications.
- C. Lenses:
 - 1. Install in manner that provides maximum coverage of area being monitored by camera.
 - a. Lens Components:
 - 1) 1/3-inch to fit CCD fixed camera.
 - 2) Glass with coated optics.
 - 3) Mounts that are compatible with camera selected.
 - 4) Packaged and supplied with camera.
 - 5) Maximum f-stop of f/1.3 for fixed lenses and maximum f-stop of f/1.6 for variable focus lenses.
 - 6) Equip with an auto-iris mechanism.
 - 7) Sufficient circle of illumination to cover image sensor evenly.
 - 8) Do not use on camera with an image format larger than lens is designed to cover.

- 9) Provide with preset capability.
- b. Types of lenses for both interior and exterior fixed cameras:
 - 1) Manual Variable Focus:
 - (a) Utilized in large areas that are being monitored by camera.
 - (b) Allow for setting virtually any angle of field, which maximizes surveillance effects.
 - 2) Auto-iris fixed.
- D. Cameras must have appropriate lens installed for the environment where located. If information cannot be obtained from drawings and specifications regarding site conditions, a site visit will be required.
- E. Cameras to be either dome style or installed in dome enclosure unless drawings indicate differently.

2.05 CAMERA ENCLOSURES AND MOUNTS

- A. Camera enclosures are protective housings designed to shield surveillance cameras from environmental factors, physical damage, and tampering.
- B. This Section pertains to interior and exterior enclosures, domes and applicable wall, ceiling, corner, pole and rooftop mounts associated with camera. Enclosures and mounts to match type of cameras used and be provided by same manufacturer as camera.
- C. Cameras and lenses must be housed in tamper resistant enclosures. Any additional mounting hardware required to install camera at its specified location to be provided with enclosure.
- D. Install camera enclosures appropriate for environment where being installed.
- E. Install exterior enclosures with following capabilities, components and functions:
 - 1. Provides a condensation free environment.
 - 2. Operates in 100 percent condensing humidity atmosphere.
 - 3. Has visible humidity indicator.
 - 4. Contains camera mounts or supports as needed to allow for correct positioning of camera and lens.
 - 5. Enclosure and sunshield must match architectural requirements as to finish.
- F. Indoor Enclosures and Mounts:
 - 1. Ceiling Mounted Cameras and Enclosures:
 - a. Install in finished or suspended ceiling. Any installation in situations where there is no finished ceiling and camera is installed attached to structure will require prior coordination with architect for acceptable mounting technique and conduit routing.
 - b. Install cameras and enclosures in suspended ceilings with a tile bridge or other factory manufactured device that does not rely on tile grid for support. Secure all enclosures to structure.
 - c. Interior dome camera installations to be installed with lowest profile option available.
 - 2. Interior Wall-Mounted Cameras and Enclosures:
 - a. Install enclosure in manner that matches existing architectural finishes.
 - b. Install at height that maintains greatest possible coverage but is not accessible to public.
 - 3. Interior Dome Cameras and Enclosures:
 - a. Interior dome camera can be pendant mounted, ceiling mounted, surface mounted, or corner mounted equipment. Coordinate with architect when determining which mount to use.
 - b. Install dome enclosures that have smoked or tinted acrylic covers with light attenuation factor of no more than 1 f-stop.
 - 4. Pan, Tilt, Zoom Capable Dome Camera:

- a. Install dome with integral electronic pan/tilt capabilities complete with wiring, wiring harness, connectors, receiver/driver, pan/tilt control system, pre-position cards, or any other hardware and equipment as needed to fully provide fully functional pan/tilt dome.
- b. Install PTZ domes with following characteristics:
 - 1) Constructed of heavy-duty bearings and hardened steel gears.
 - 2) Permanently lubricated to ensure smooth and consistent movement of all parts throughout life of product.
 - 3) Equipped with motors that are thermally or impedance protected against overload damage.
 - 4) 360 degrees pan and minimum plus or minus 90 degrees tilt.
 - 5) Pan speed minimum of 10 degrees per second.
- G. Exterior Dome Camera and Enclosures.
 - 1. Install exterior dome cameras and enclosures that meet, as minimum, requirements listed for interior dome cameras above.
 - 2. Install enclosures that are constructed to be dust and watertight and fully operational in 100 percent condensing humidity.
 - 3. Exterior Wall-Mounted Camera:
 - a. Install mount with an adjustable head for mounting camera.
 - b. Install mount constructed of aluminum, stainless steel, or steel with corrosion-resistant finish.
 - c. PTZ minimum requirements:
 - 1) Plus, or minus 90 degrees of pan.
 - 2) Plus, or minus 45 degrees of tilt.
 - 3) Installed at height that allows for maximum coverage of area being monitored.

2.06 CABLE, WIRE AND ACCESSORIES

- A. Install signal cables required for correct operations in conduit from controller or network switch to camera.
- B. Copper Cabling:
 - 1. Match cable installed under Division 27, Communications.
 - 2. 24V Power: 16 AWG twisted pair construction, or as otherwise noted by camera manufacturer.
 - 3. Cabling must be plenum rated where required.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

- A. Provide new cameras where shown on Drawings.
- B. Once project begins, confirm each camera location and field of view with signature from Owner's Authorized Representative before camera mount is secured in place.
- C. Headend video surveillance equipment:
 - 1. Rack mounted with equipment positioned according to Drawings. Once project begins, confirm equipment location(s) with signature from Owner's Authorized Representative before being mounted in place. Position equipment and racks to allow for most secure and convenient access for operation and service.
- D. Provide service loops at headend and camera equipment locations for each cable run. Neatly dress and tie wrap cabling. Label cables with laser, inkjet or machine printed labels. Do not use handwritten labels.
- E. Testing Requirements:

1. Perform electrical and mechanical tests recommended by equipment manufacturer and required in this specification. Bench settings are not acceptable. Hold final tests and acceptance in presence of Owner and manufacturer's representative. Supply personnel and required auxiliary equipment for this test without additional cost to owner. Allow 5-day "burn-in" time prior to preliminary testing.
- F. Training Requirements:
 1. Provide eight hours of training of operational instruction and two hours of maintenance instruction. Training seminars are to be hands-on instruction held at Owner's facility.
 2. Provide Owner with manufacturer's operating instructions.
 3. Provide factory trained representatives to instruct Owner's personnel in the operation of system equipment.
 4. Provide Owner's Authorized Representative with training plan and training checklist two weeks before planned training according to manufacturer's instructions.
 5. Provide comprehensive training for Owner's Authorized Representative for operation, maintenance and troubleshooting of surveillance system. Attend training session and video tape by Commissioning Authority.
 6. Security contractor will fully explain and demonstrate operation, function and override of surveillance system including, but not limited to: Camera sequencing, software operation, remote access, programming, priority levels and monitoring station.
- G. Cutting and Patching:
 1. Security Integrator / Contractor is responsible for cutting, fitting or patching that may be required to complete work.

3.02 VIDEO MANAGEMENT SYSTEM (VMS)

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.

3.03 VIDEO RECORDING SYSTEM

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.

3.04 CAMERAS AND LENSES

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.

3.05 CAMERA ENCLOSURES AND MOUNTS

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.

3.06 CABLE, WIRE AND ACCESSORIES

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.

END OF SECTION

SECTION 28 31 00
INTRUSION DETECTION SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

- A. Work included:
 - 1. Intrusion Detection Control Panel
 - 2. Keypads
 - 3. Door Position Sensors
 - 4. Motion Detectors
 - 5. Cabling

1.02 RELATED SECTIONS

- A. Contents of Division 28, Electronic Safety and Security and Division 01, General Requirements apply to this Section.
- B. In addition, reference the following:
 - 1. Section 08 71 00, Door Hardware (by others)
 - 2. Section 28 14 00, Access Control System
 - 3. Section 28 20 00, Video Surveillance System

1.03 REFERENCES AND STANDARDS

- A. References and Standards as required by Section 28 00 00, Electronic Safety and Security Basic Requirements and Division 01, General Requirements.
- B. Adhere to the most recent published edition of codes, rules, regulations, standards, manufacturer's instructions, or requirements of regulatory agencies as of the contract date. Promptly notify telecom engineer of any discrepancies between construction documents or conditions and the stipulated codes, standards, guidelines, and specifications. In case of conflicts, the more stringent requirement must take precedence.
- C. In addition, meet the following:
 - 1. Provide system wiring in accordance with good engineering practices as established by the Telecommunications Industry Association (TIA), the National Electrical Code (NEC), and the Building Industry Consulting Services International (BICSI).
- D. Abbreviations and Acronyms:
 - 1. ACS – Access Control System
 - 2. AWG – American Wire Gauge
 - 3. DPOT - Double Pole Double Throw
 - 4. IDS – Intrusion Detection System
 - 5. SPDT - Single Pole Double Throw
 - 6. UTP – Unshielded Twisted Pair
 - 7. VSS – Video Surveillance System

1.04 SUBMITTALS

- A. Submittals as required by Division 28, Electronic Safety and Security and Division 01, General Requirements.
- B. Work must not begin until shop drawings and submittals are approved.
 - 1. The intent of submitting shop drawings and submittals for approval is for contractors to display a conceptual understanding of the Construction Documents.
- C. Contractors must request drawing backgrounds from the Architect and create shop drawings using their own Titleblock. Shop drawings that copy construction documents will be rejected.
- D. Submittals and Shop Drawings must be approved four weeks prior to ordering products.
- E. In addition, provide:
 - 1. Product Data Cut Sheets:

- a. Provide manufacturer's cut sheets with a red arrow and highlighted part numbers even if cut sheet has only one part number associated.
- 2. Shop Drawings that include, but are not limited to the following:
 - a. Intrusion Detection Control Panel wall elevations
 - b. Device locations on floor plans
 - c. Cable pathways and routing
 - d. Installation details
 - e. Point-to-point list and wiring details
- F. Submittal Requirements at Closeout:
 - 1. Provide as-built drawings with panel layouts, rack elevations, and device locations with labeling.
- G. Substitutions:
 - 1. Substitutions must conform to the general requirements as outlined in Section 28 00 00, Electronic Safety and Security Basic Requirements.

1.05 QUALITY ASSURANCE

- A. Quality assurance as required by Section 28 00 00, Electronic Safety and Security Basic Requirements and Division 01, General Requirements.
- B. Pre-Construction Meeting:
 - 1. Contractor must initiate a virtual or on-site pre-construction meeting to discuss installation procedures.
- C. ~~Installer Qualifications:-~~
 - 1. ~~Contractor specializing in performing work of this section with a minimum of three years documented experience.~~
 - 2. ~~Contractor must be certified by the manufacturer to install the design components.~~ (Deleted by Addendum 2)
- D. Work shall be performed by the Owner Designated Integrator.
 - 1. Owner Designated Integrator: Point Monitor.
 - 2. No substitutions permitted. (Added by Addendum 2)
- E. Regulatory Requirements:
 - 1. Installation must comply with applicable building codes and regulations.

1.06 WARRANTY

- A. Warranty of materials and workmanship as required by Section 28 00 00, Electronic Safety and Security Basic Requirements and Division 01, General Requirements.
- B. The contractor's warranty of the physical installation must be valid for a period of no less than 1 year.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Intrusion Detection Control Panel:
 - 1. Match Existing
- B. Keypads:
 - 1. Match Existing
- C. Door Position Sensors:
 - 1. Interlogix
 - 2. Nascom
 - 3. Or engineer approved equivalent
- D. Motion Detectors:
 - 1. Bosch
 - 2. Honeywell

- 3. Or engineer approved equivalent
- E. Cabling:
 - 1. West Penn Wire
 - 2. Or engineer approved equivalent

2.02 INTRUSION DETECTION CONTROL PANEL

- A. Central processing unit for the IDS, coordinating all input from detectors and sensors and output to alarm devices.
- B. Must support both wired and wireless connectivity to accommodate a range of installation scenarios.
- C. Functionality:
 - 1. Zones:
 - a. Minimum of 8 programmable zones, each independently configurable for different detection types and alert responses.
 - 2. User Access Control:
 - a. Multiple user codes with customizable access levels.
 - b. Duress code feature to allow silent activation in emergencies.
 - c. Keypad compatibility with panic button options.
 - 3. Communication Protocols:
 - a. Support for IP, cellular, or landline communication for alarm transmission to central monitoring.
 - b. Backup communication options in case of primary line failure.
 - 4. Power Supply:
 - a. Primary AC power supply with UL Listed battery backup, capable of a minimum of 24-hour operation during outages.
 - b. Low battery alert to notify users of power supply issues.
 - 5. Tamper Protection:
 - a. Tamper-resistant enclosure with security lock and automatic alert for unauthorized access or tampering.
 - b. Monitoring for both control panel enclosure and connected devices for any tampering.
 - 6. Display and Interface:
 - a. Backlit LCD or LED display for status monitoring, system programming, and fault notifications.
 - b. Integrated keypad or touchscreen options for system operation and diagnostics.
 - 7. Data Logging and Reporting:
 - a. Event log storage with minimum 500-event capacity, including arming/disarming, alarms, faults, and power issues.
 - b. Real-time reporting and data export capabilities for analysis and record-keeping.
 - 8. Remote Management:
 - a. Support for mobile and web-based remote management for arming, disarming, and viewing status.
 - b. Secure access with multi-factor authentication.

2.03 KEYPADS

- A. User interface device for arming, disarming, and accessing IDS system functions.
- B. Keypads must include panic button functionality, visual and audible feedback, and support for multi-level access control.
- C. Functionality:
 - 1. Backlit LCD or LED display for clear visibility in low-light conditions.
 - 2. Multi-Line Display capability to show system status, alerts, and user prompts.
- D. User Access Control:

1. Support for multiple user codes with customizable access levels (administrator, user, guest).
 2. Lockout feature after a specified number of incorrect entries to prevent unauthorized access.
 3. Duress code features to allow silent alarm activation if the user is under threat.
- E. Panic Button:
1. Built-in panic button for quick alarm activation, programmable for silent or audible alerts.
 2. Tamper-resistant design to prevent accidental activation.
- F. Alarm Status Indicators:
1. Audible tones for arming, disarming and fault notification.
 2. LED indicators or status icons for "Armed," "Disarmed," "Fault," and "Alarm" conditions.
- G. Power Supply:
1. Primary power from the IDS control panel with backup battery support.
 2. Low-power indicator to notify the user when power supply is insufficient.
- H. Remote Control Compatibility:
1. Compatibility with mobile or web-based remote monitoring, where control panel allows, for arming, disarming, and viewing system status.
- I. Construction:
1. Sleek, low-profile design suitable for discreet placement in commercial and residential settings.

2.04 DOOR POSITION SENSORS

- A. A device used to monitor and detect the open or closed status of a door.
- B. Types:
1. Magnetic Contact Sensors
 2. Reed Switch Sensors
 3. Electromechanical Sensors
 4. Integrated Door and Lock Sensors
- C. Contact Configurations:
1. SPDT
 2. DPDT

2.05 MOTION DETECTORS

- A. A device for detecting movement in protected areas, available in wall-mounted and ceiling-mounted models to provide customized coverage for specific spaces.
- B. Functionality:
1. Dual technology (Passive Infrared and Microwave) for reducing false alarms by requiring both infrared and motion detection.
 2. Adjustable sensitivity levels to minimize false triggers from environmental factors or small animals.
 3. PIR-only models as an alternative, suited to environments with limited temperature fluctuations.
- C. Coverage Range:
1. Wall-Mounted Detectors:
 - a. Minimum coverage area of 50 feet by 50 feet with a 90-degree detection angle.
 2. Ceiling-Mounted Detectors:
 - a. 360-degree coverage with a minimum diameter of 50 feet for open areas.
- D. Tamper Protection:
1. Tamper-resistant housing with alarm activation upon unauthorized access or removal.
- E. Environmental:

1. Immunity to environmental factors such as changes in temperature, sunlight, and air movement to reduce false alarms.
- F. Status Indicators:
 1. LED indicators for system and diagnostic testing, providing visual confirmation of detector activity.
 2. Optional disable function to turn off LED indicators for covert operation.
- G. Power Supply:
 1. Primary power sourced from IDS control panel, with low power indicators to notify of power issues.
 2. Battery backup capability where required for standalone operation.
- H. Compatibility
 1. Integration with IDS control panels for centralized monitoring and configuration.
 2. Configurable for use with remote management systems for status viewing and alarm response.

2.06 CABLING

- A. Cabling used to connect intrusion detection components, ensuring reliable signal transmission for sensors, control panels, and alarm devices.
- B. Copper:
 1. Power
 - a. 18 AWG, 2 pair, UTP
 2. RS-232
 - a. 18 AWG, 4 Conductor, Shielded
 3. IP Cabling
 - a. Match Division 27, horizontal cabling type
- C. Connectors:
 1. Modular connector.
 2. 24 V Power, Screw-down on spade lug.
- D. Indicate any additional wiring required by the manufacturer's installation instructions on the submittal drawings and diagrams.
- E. Cabling must be plenum-rated where required. Contractor must obtain clarification from Authority Having Jurisdiction (AHJ) if any uncertainty exists.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

- A. Install equipment in compliance with manufacturer's guidelines, NEC, and local codes.
- B. Coordinate installation locations with drawings and related trades to avoid conflicts.
- C. Ensure equipment is installed in secure locations and protected from physical damage, tampering, or unauthorized access.
- D. Label all cables, wiring, and devices for identification and troubleshooting.
- E. Mount devices securely to designated surfaces, ensuring stability and alignment with accessibility requirements.
- F. Conduct installation without obstructing normal access paths or violating ADA compliance.
- G. Perform work with minimal disruption to other operations within the facility.
- H. Provide a minimum of 0.75-inch conduit to each IDS device.
- I. Provide the following training to system users to ensure a comprehensive understanding of Intrusion Detection System operations, minimizing potential operational errors.
 1. Training Requirements (in conjunction with the ACS and VSS):

- a. Conduct a total of eight hours of operational training and two hours of maintenance training. Training sessions must be conducted as hands-on seminars at Owner's facility.
 - b. Provide Owner with manufacturer's operating instructions and documentation.
 2. Instructors:
 - a. Supply factory-trained representative to instruct Owner's personnel in the operation and maintenance of IDS equipment
 3. Training Documentation:
 - a. Submit a detailed training plan and checklist to Owner's Authorized Representative two weeks prior to scheduled training, in accordance with manufacturer's guidelines.
 4. Training Scope:
 - a. Provide comprehensive instruction for Owner's Authorized Representative, covering operation, maintenance and troubleshooting of the IDS.
 5. System Operation and Demonstration:
 - a. Security integrator/contractor must thoroughly explain and demonstrate system operation, including software functions, remote access capabilities, programming procedures, prior level configuration, monitoring station use, and system override functions.
- J. Quality of Work:
 1. Comply with industry standards unless specified requirements indicate more stringent standards or more precise quality of work.
 2. Contractor/integrator must be a certified installer for the selected manufacturer(s) prior to, during, and throughout the completion of the system installation and must be able to provide the manufacturer's extended warranty.
 3. Maintain quality control over all suppliers and subcontractors to ensure adherence to project specifications.
- K. Equipment Pretest:
 1. Bench test equipment prior to delivery to job site and before installation, in accordance with the manufacturer's installation instructions.
- L. Fire Rated Doors and Frames:
 1. Do not modify any Fire-rated door or frame in a way that would void its UL Listing or fire rating.
- M. Bonding:
 1. Bond equipment to an earth-ground in accordance with manufacturer's requirements for IDS systems
 2. Connect earth-ground to a dedicated ground rod or an approval cold-water pipe.
 3. Do not use electrical system grounds or telephone grounds for earth-ground connections.
 4. Do not use mounting posts or building structural steel as earth-ground connections.
- N. Cutting and Patching:
 1. Security Integrator / Contractor is responsible for cutting, fitting, or patching as required to complete the work.

3.02 INTRUSION DETECTION CONTROL PANEL

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.
- C. Mount intrusion detection control panels in secure, accessible locations where shown on drawings.
- D. Connect intrusion detection control panels to power supplies, communication networks, and intrusion detection system devices according to manufacturer's guidelines.
- E. Ensure each panel is bonded according to Division 26.

- F. Test each panel to confirm accurate response to input from connected devices and successful communication with intrusion detection system software.

3.03 KEYPADS

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.
- C. Install keypads where shown on drawings, ensuring secure and tamper-resistant mounting.
- D. Connect each keypad to IDS panels using manufacturer-suggested cabling.
- E. Confirm compatibility with ACS and test to verify proper function.

3.04 DOOR POSITION SENSORS

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.
- C. Install door position sensors on specified doors to monitor open/closed status, integrating with ACS to provide real-time monitoring.
- D. Connect sensors to IDS control panels, ensuring alignment and unobstructed operation of doors.
- E. Test each sensor to verify accurate status reporting in IDS software.

3.05 MOTION DETECTORS

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.
- C. Install wall-mounted detectors at recommended heights (typically 7-10 feet) and ceiling-mounted detectors in central areas for 360-degree coverage where shown on drawings.
- D. Position to avoid interference from HVAC vents, direct sunlight, or reflective surfaces.
- E. Connect to IDS control panel, ensuring tamper-proof connections and continuous signal checks.
- F. Calibrate sensors for optimal sensitivity to prevent false alarms while ensuring accurate detection.

3.06 CABLING

- A. Reference General Installation Requirements above.
- B. Install per manufacturer's instructions and recommendations.
- C. Route cabling for IDS components according to local codes and standards in designated cable pathways to ensure protection and signal integrity.
- D. Secure and protect cabling from physical damage, electromagnetic interference, and unauthorized access.
- E. Terminate cables according to manufacturer instructions and label each end for easy identification.
- F. Test all cabling for continuity, signal quality, and reliability.

END OF SECTION

SECTION 28 46 00
FIRE DETECTION AND ALARM

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Included:
 - 1. Fire Alarm Control Panel
 - 2. Notification Appliance Circuit Panels
 - 3. Manual Pull Stations
 - 4. Fixed Temperature Heat Detectors
 - 5. Rate-of-Rise and Fixed Temperature Heat Detectors
 - 6. Photoelectric Type Smoke Detectors
 - 7. Duct-Mounted Smoke Detectors
 - 8. Relay Modules
 - 9. Control Modules
 - 10. Input Modules
 - 11. Fault Isolation Modules
 - 12. Combination Horn/Strobes
 - 13. Strobes
 - 14. Horns
 - 15. Weatherproof/Surface Backboxes
 - 16. Circuit Conductors
 - 17. Surge Protection
 - 18. Batteries
 - 19. Locks and Keys
- B. Scope: Provide modification and extension of the existing fire alarm system to accommodate tenant improvement.
- C. In addition, provide design for the following as required in these Contract Documents: Fire alarm system.
- D. System Design:
 - 1. Design Criteria:
 - a. These are Contractor designed systems. Contact AHJ prior to bid to verify systems' requirements. Design systems in compliance with code as interpreted by the AHJ.
 - b. In addition to code requirements, remove and relocate fire alarm equipment as required to accommodate the tenant improvement.
 - c. Fire Alarm Sequence of Operation: Match Existing.
 - d. Supervisory Sequence of Operation: Match Existing.
 - e. Trouble Sequence of Operation: Match Existing.

1.02 RELATED SECTIONS

- A. Contents of Division 28, Electronic Safety and Security and Division 01, General Requirements apply to this Section.
- B. Division 26, Electrical requirements apply to this section.

1.03 REFERENCES AND STANDARDS

- A. References and Standards as required by Division 28, Electronic Safety and Security and Division 01, General Requirements.
- B. In addition, meet the following:
 - 1. NFPA 72, National Fire Alarm and Signaling Code, adopted edition.
 - 2. NFPA 70, National Electrical Code, adopted edition.

1.04 SUBMITTALS

- A. Submittals as required by Division 28, Electronic Safety and Security and Division 01, General Requirements.
- B. Documentation: Submit documentation required per NFPA 72; Minimum Required Documentation.
- C. Shop Drawings:
 - 1. Submit shop drawings which include documentation required per NFPA 72; Shop Drawings.
 - 2. In addition, provide the following:
 - a. System designer NICET certification number or Engineer's signature and seal on shop drawings.
 - b. Identification of system designer and evidence of qualification or certification of designer as required by AHJ.
 - c. Device address adjacent to each device symbol. Notification appliance circuit and number adjacent to each notification appliance symbol.
 - d. Point to point wiring indicating the quantity and gauge of the conductors and size of conduit/raceway used.
- D. Operation and Maintenance Manuals:
 - 1. Provide manuals containing the documentation required in NFPA 72; Completion Documentation.
 - 2. In addition, provide the following:
 - a. Warranty agreement.
 - b. Instruction chart.

1.05 QUALITY ASSURANCE

- A. Quality assurance as required by Division 28, Electronic Safety and Security and Division 01, General Requirements.
- B. In addition, meet City of Clackamas, Oregon requirements, ordinances and amendments.
- C. Work shall be performed by the Owner Designated Integrator.
 - 1. Owner Designated Integrator: First Response
 - 2. No substitutions permitted. (Added by Addendum 2)

1.06 WARRANTY

- A. Warranty of materials and workmanship as required by Division 28, Electronic Safety and Security and Division 01, General Requirements.
- B. In addition, provide one year warranty agreement including parts and labor. Warranty period begins upon date of substantial completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Fire Alarm Control Panel:
 - 1. Silent Knight
 - 2. No substitutions permitted.
- B. Notification Appliance Circuit Panels:
 - 1. Same manufacturer as fire alarm control equipment.
 - 2. No substitutions permitted.
- C. Manual Pull Stations:
 - 1. Same manufacturer as fire alarm control equipment.
 - 2. No substitutions permitted.
- D. Fixed Temperature Heat Detectors:
 - 1. Same manufacturer as fire alarm control equipment.

2. No substitutions permitted.
- E. Rate-of-Rise and Fixed Temperature Heat Detectors:
 1. Same manufacturer as fire alarm control equipment.
 2. No substitutions permitted.
- F. Photoelectric Type Smoke Detectors:
 1. Same manufacturer as fire alarm control equipment.
 2. No substitutions permitted.
- G. Duct-Mounted Smoke Detectors:
 1. Same manufacturer as fire alarm control equipment.
 2. No substitutions permitted.
- H. Relay Modules:
 1. Same manufacturer as fire alarm control equipment.
 2. No substitutions permitted.
- I. Control Modules:
 1. Same manufacturer as fire alarm control equipment.
 2. No substitutions permitted.
- J. Input Modules:
 1. Same manufacturer as fire alarm control equipment.
 2. No substitutions permitted.
- K. Fault Isolation Modules:
 1. Same manufacturer as fire alarm control equipment.
 2. No substitutions permitted.
- L. Combination Horn/Strobes:
 1. Same manufacturer as fire alarm control equipment.
 2. System Sensor
 3. Or approved equivalent.
- M. Strobes:
 1. Same manufacturer as fire alarm control equipment.
 2. System Sensor
 3. Or approved equivalent.
- N. Horns:
 1. Same manufacturer as fire alarm control equipment.
 2. System Sensor
 3. Or approved equivalent.
- O. Weatherproof/Surface Backboxes:
 1. Same manufacturer as fire alarm detection devices or notification appliances.
 2. Or approved equivalent.
- P. Circuit Conductors:
 1. Allied Wire and Cable
 2. Belden
 3. CCI
 4. West Penn Wire
 5. Or approved equivalent.
- Q. Surge Protection:
 1. Ditek
 2. Transtector
 3. Or approved equivalent.
- R. Batteries:
 1. Same manufacturer as fire alarm control equipment.

2. Power-Sonic
 3. Werker
 4. Or approved equivalent.
- S. Locks and Keys:
1. Same manufacturer as fire alarm control equipment.
 2. Or approved equivalent.
- T. Substitutions: For substitution of products by manufacturers not listed, submit product data showing features and certification by Contractor that the design will comply with contract documents.
- U. Equipment to be supplied by a certified manufacturer representative.

2.02 FIRE ALARM CONTROL PANEL

- A. Existing Model 6700, manufactured by Silent Knight.
- B. Power Supply: Provide power supply(s), adequate to serve control panel modules, remote annunciators, addressable devices, notification appliances and other connected devices.
- C. Power Requirements: Provide batteries and charging systems as required to accommodate modifications to the existing fire alarm system.
- D. Addressing: Provide each initiating device with its own discrete address.

2.03 NOTIFICATION APPLIANCE CIRCUIT PANELS

- A. Provide power supply(s), adequate to serve modules, remote annunciators, initiating devices, notification appliances and other connected devices or appliances.
- B. Provide batteries in locking cabinet manufactured for purpose.

2.04 MANUAL PULL STATIONS

- A. Provide flush mounted units where installed in finished areas; in unfinished areas, surface mounted units are acceptable, unless otherwise noted.
- B. Semi-flush, red finish, nongrasping operation; maximum pull strength as allowed per ADA criteria.
- C. Stations do not allow closure without keyed reset.

2.05 FIXED TEMPERATURE HEAT DETECTORS

- A. Provide flush mounted units where installed in finished areas; in unfinished areas, surface mounted units are acceptable, unless otherwise noted.
- B. Rated 135 degrees F or 190 degrees F as required by space use.
- C. Provide white, low-profile detectors.

2.06 RATE-OF-RISE AND FIXED TEMPERATURE HEAT DETECTORS

- A. Provide flush mounted units where installed in finished areas; in unfinished areas, surface mounted units are acceptable, unless otherwise noted.
- B. Responding to 15 degrees F temperature rise per minute and to 135 degrees F fixed temperature as required by space use.
- C. Provide white, low-profile detectors.

2.07 PHOTOELECTRIC TYPE SMOKE DETECTORS

- A. Provide flush mounted units where installed in finished areas; in unfinished areas, surface mounted units are acceptable, unless otherwise noted.
- B. Panel adjustable sensitivity, LED source, multiple cell, 360 degree smoke entry, visual latching operation indicator, insect screen, two-wire operation and vandal-resistant locking feature.

2.08 DUCT-MOUNTED SMOKE DETECTORS

- A. Photoelectric type. Duct sampling tubes extending width of duct, visual indication of detector actuation, direct housing mount.
- B. Detector powered from control panel, power on indicator light.
- C. Detector rated for air velocity, humidity and temperature of duct and environment where installed.

2.09 RELAY MODULES

- A. Signaling line circuit interface module that connects to other building systems for control of fire/life safety functions, e.g., air-handler shutdown, fire/smoke damper closure, elevator recall.
- B. Module powered from control panel.

2.10 CONTROL MODULES

- A. Signaling line circuit interface module that provides notification appliance circuits or system control outputs.
- B. Module powered from control panel.

2.11 INPUT MODULES

- A. Signaling line circuit interface module that provides initiating device circuits for connection to contact closure initiating devices.
- B. Module powered from control panel.

2.12 FAULT ISOLATION MODULES

- A. Signaling line circuit interface modules that provide isolation of wire-to-wire shorts on a signaling line circuit with automatic reconnection upon correction of short circuit.
- B. Provide module with status indicator LED.

2.13 COMBINATION HORN/STROBES

- A. Multi-candela, flush wall and ceiling mount, red finish, insect-proof.
- B. Provide horn/strobes that meet the latest requirements of NFPA 72, ANSI 117.1 and UL 1971. Candela rating as required by NFPA 72.
- C. Must be compatible with fire alarm control equipment and notification appliance circuit panels.

2.14 STROBES

- A. Multi-candela, flush wall and ceiling mount, red finish, insect-proof.
- B. Provide strobes that meet the latest requirements of NFPA 72, ANSI 117.1 and UL 1971. Candela rating as required by NFPA 72.
- C. Must be compatible with fire alarm control equipment and notification appliance circuit panels.

2.15 HORNS

- A. Flush wall and ceiling mount, red finish, insect-proof.
- B. Provide horns that meet the latest requirements of NFPA 72.
- C. Must be compatible with fire alarm control equipment and notification appliance circuit panels.

2.16 WEATHERPROOF/SURFACE BACKBOXES

- A. Rated for exterior use.
- B. Compatible with device or appliance.

2.17 CIRCUIT CONDUCTORS

- A. Copper or optical fiber; color code and label. Type FPL, FPLR and FPLP. Cable type as required by the NEC and the manufacturer.
- B. Minimum signaling line circuit and initiating device circuit wire size: AWG18.

- C. Minimum notification appliance circuit wire size: AWG14, or as approved by Engineer.
- D. Fiber optic cable as required by manufacturer.

2.18 SURGE PROTECTION

- A. Provide for alternating current circuits powering fire alarm equipment.
- B. Initiating Device Circuits, Notification Appliance Circuits and Communications Circuits: Rated to protect applicable equipment; for 24V(dc) maximum dc clamping voltage of 36V(dc), line-to-ground and 72V(dc), line-to-line.

2.19 BATTERIES

- A. Provide additional cabinet, if required due to space limitations in control panels.

2.20 LOCKS AND KEYS

- A. Provide same standard lock and key for each key operated switch and lockable panel and cabinet.
- B. Provide five keys of each type.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

- A. Provide a complete and operable system compliant with all applicable codes and standards.
- B. Install per manufacturer's instructions and recommendations.
- C. Obtain Architect's approval of locations of devices, appliances and annunciators before installation.
- D. Circuits:
 - 1. Signaling Line Circuits (SLC): Class B
 - 2. Notification Appliance Circuits (NAC): Class B.
- E. Spare Capacity:
 - 1. New Notification Appliance Circuits:
 - a. Minimum 25 percent spare current capacity.
 - b. Maximum 10 percent voltage drop.
 - c. Utilize UL maximum current draw value for notification appliances in calculations.
 - 2. Existing Notification Appliance Circuits:
 - a. Not to exceed manufacturer's listed loading for the circuit and/or power supply.
 - b. Voltage at last device must be within the manufacturer's listed requirements.
 - 3. New Signaling Line Circuit: Minimum 25 percent spare device capacity.
- F. Power Sources:
 - 1. Primary: Dedicated branch circuits of facility power distribution system.
 - 2. Secondary: Storage batteries.
 - 3. Capacity: Sufficient to operate fire alarm system under normal supervisory condition for 24 hours and operate alarm signals for five minutes at end of standby period.
- G. Obtain approval of system design from AHJ prior to installation. Do not begin installation without approval from AHJ and submittal review comments from Engineer.
- H. Install in accordance with applicable codes, NFPA 72, NFPA 70 and the Contract Documents.
- I. In accordance with manufacturer's instructions, provide wiring, conduit and outlet boxes required for the erection of a complete system as described in these specifications, as shown on Drawings and as required by AHJ.
- J. Conceal wiring, conduit, boxes and supports where installed in finished areas.
- K. Provide raceway system for cabling concealed in walls and hard ceilings and in locations where cabling is exposed. Where exposed, provide surface raceway in finished areas and surface mounted EMT in non-finished areas. Support open cabling at intervals not to exceed 5-feet.

- L. Provide cabling and conduits system suitable for wet locations for below grade systems.
- M. At junction boxes and termination points, provide identification tags on wires and cables.
- N. Route wiring to avoid blocking access to equipment requiring service, access, or adjustment.
- O. Existing Components:
 - 1. Existing Fire Alarm System: Maintain fully operational during construction in all areas except areas of remodel.
 - 2. Disable system only to make switchovers and connections.
 - a. Notify Owner before partially or completely disabling system.
 - b. Notify local fire service.
 - c. Make notifications at least five working days in advance.
 - d. Make temporary connections to maintain service in areas adjacent to work area.
 - 3. Provide fire watch in areas where the system is not functioning.
 - 4. Equipment Removal:
 - a. Remove existing system after acceptance of new fire alarm system. Restore damaged surfaces.
 - b. Package operational fire alarm and detection equipment that has been removed and offer to Owner prior to disposal.
 - c. Remove from site and legally dispose of remainder of existing material.
 - 5. On-Premises Supervising Station: Include, as part of this work, modifications necessary to existing supervising station to accommodate new fire alarm work.
- P. Fire Safety Systems Interfaces:
 - 1. Provide conduit, wiring, boxes and terminations from fire alarm system to monitored components. Provide a separate input module for each switch or relay to be monitored.
 - a. Alarm Inputs: Provide connection in accordance with NFPA 72 for the following systems and components:
 - 1) Other alarm inputs.
 - b. Supervisory Inputs: Provide connection in accordance with NFPA 72 for the following systems and components:
 - 1) Other supervisory inputs.
 - c. Trouble Inputs: Provide connection in accordance with NFPA 72 for the following systems and components:
 - 1) Other trouble inputs.
 - 2. Fire Safety Functions:
 - a. General: Provide power and control conduit, wiring, boxes and terminations to power devices and interface to fire alarm system.
 - b. HVAC Systems:
 - 1) Fire/Smoke Dampers and Smoke Dampers:
 - (a) Provide required smoke detectors, relays, wiring and the like.
 - (b) Connect control and power wiring to dampers per manufacturer's instructions.
 - (c) Verify quantities, location and requirements of dampers with Division 23, HVAC Drawings and Specifications and mechanical system installer.
 - 2) Air Moving Systems:
 - (a) Provide duct-mounted smoke detector for air systems with air flow rates exceeding 2000 CFM. Coordinate with Division 23, HVAC.
 - (b) Install duct-mounted smoke detector(s) on return side of air system.
 - (c) Provide control wiring from addressable relay contacts to air handling equipment controller.
 - (d) Provide duct-mounted smoke detectors rated for air velocity, temperature and humidity of duct. Verify quantities, locations and requirements with Division 23, HVAC Drawings and mechanical system installer.

- (e) Where duct-mounted smoke detectors are mounted in inaccessible building void spaces provide access hatch. Provide access hatch with fire rating equivalent to rating of wall, ceiling, or shaft being penetrated.

Q. Inspection and Testing for Completion:

1. System testing and commissioning to be performed by a certified manufacturer representative.
2. Perform inspection and testing in accordance with NFPA 72 and requirements of local authorities; document each inspection and test.
3. Document audibility measurements and verify intelligibility for each space on record drawings.
4. Provide the services of the installer's supervisor or person with equivalent qualifications to supervise inspection and testing, correction and adjustments.
5. Provide tools, software and supplies required to accomplish inspection and testing.
6. Prepare for testing by ensuring that work is complete and correct; perform preliminary tests as required to test system.
7. Correct defective work, adjust for proper operation and retest until entire system complies with Contract Documents.
8. Notify Owner seven days prior to beginning completion inspections and tests.
9. Notify authorities having jurisdiction and comply with their requirements for scheduling inspections and tests and for observation by their personnel.
10. Diagnostic Period: After successful completion of inspections and tests, operate system in normal mode for at least 14 days without any system or equipment malfunctions.
 - a. Record all system operations and malfunctions.
 - b. If a malfunction occurs, start diagnostic period over after correction of malfunction.
 - c. Replace devices with readings outside of allowed value at time of system check out.
 - d. Owner will provide attendant operator personnel during diagnostic period; schedule training to allow Owner personnel to perform normal duties.
 - e. At end of successful diagnostic period, complete and submit NFPA 72 "Inspection and Testing Form."

R. Closeout:

1. Closeout Demonstration:
 - a. Demonstrate proper operation of functions to Owner.
 - b. Be prepared to conduct any of the required tests.
 - c. Have at least one copy of operation and maintenance data, copy of project record drawings, input/output matrix and operator instruction chart(s) available during demonstration.
 - d. Have authorized technical representative of control unit manufacturer present during demonstration.
 - e. Demonstration may be combined with inspection and testing required by AHJ. Notify AHJ in time to schedule demonstration.
 - f. Repeat demonstration until successful.
2. Substantial Completion of the project cannot be achieved until inspection and testing is successful and:
 - a. Specified diagnostic period without malfunction has been completed.
 - b. Approved operating and maintenance data has been delivered.
 - c. Spare parts, extra materials and tools have been delivered.
 - d. All aspects of operation have been demonstrated to Architect.
 - e. Final acceptance of the fire alarm system has been given by authorities having jurisdiction.
 - f. Occupancy permit has been granted.
 - g. Specified pre-closeout instruction is complete.

3.02 FIRE ALARM CONTROL PANEL

- A. Do not install cabinets or equipment below the battery cabinet. Do not locate battery and charging system cabinets in ceiling space.
- B. Perform system programming at the fire alarm control panel. Program the system without shutting the system down. Programming is done off line. Provide copy of site-specific program on electronic storage media. Locate in document enclosure.
- C. Room Name Labeling: Control panel schedules, programming and labeling for electrical equipment, to use the room names and room numbers that the Architect adopts at the date of substantial completion of construction. This work is to be done at no added cost to the Owner.

3.03 NOTIFICATION APPLIANCE CIRCUIT PANELS

- A. Provide notification appliance circuit panel power supplies with 120VAC dedicated circuit per NFPA requirements.
- B. Do not install cabinets or equipment below the battery cabinet. Do not locate battery and charging system cabinets in ceiling space.

3.04 MANUAL PULL STATIONS

- A. Provide permanent, machine-printed address labels on addressable devices.
- B. Provide protective guard where device is subject to abuse and where required by AHJ.

3.05 FIXED TEMPERATURE HEAT DETECTORS

- A. Provide permanent, machine-printed address labels on addressable devices. Labels to be visible from the floor without magnification.
- B. Provide protective guard where device is subject to abuse and where required by AHJ.

3.06 RATE-OF-RISE AND FIXED TEMPERATURE HEAT DETECTORS

- A. Provide permanent, machine-printed address labels on addressable devices. Labels to be visible from the floor without magnification.
- B. Provide protective guard where device is subject to abuse and where required by AHJ.

3.07 PHOTOELECTRIC TYPE SMOKE DETECTORS

- A. Provide permanent, machine-printed address labels on addressable devices. Labels to be visible from the floor without magnification.
- B. Provide protective guard where device is subject to abuse and where required by AHJ.

3.08 DUCT-MOUNTED SMOKE DETECTORS

- A. Provide NEMA rated enclosure for exterior and high humidity locations.
- B. Provide remote test switch in accessible location.
- C. Provide permanent, machine-printed address labels on addressable devices. Labels to be visible from the floor without magnification.

3.09 RELAY MODULES

- A. Provide permanent, machine-printed address labels on addressable devices. Labels to be visible from the floor without magnification.
- B. Labels to include description of controlled function.

3.10 CONTROL MODULES

- A. Provide permanent, machine-printed address labels on addressable devices. Labels to be visible from the floor without magnification.
- B. Labels to include description of controlled function.

3.11 INPUT MODULES

- A. Provide permanent, machine-printed address labels on addressable devices. Labels to be visible from the floor without magnification.

- B. Labels to include description of monitored input.

3.12 FAULT ISOLATION MODULES

- A. Provide permanent, machine-printed address labels on addressable devices. Labels to be visible from the floor without magnification.
- B. Provide Fault Isolator Modules for signaling line circuit per code requirements and manufacturer instructions.

3.13 COMBINATION HORN/STROBES

- A. Provide permanent, machine-printed labels on notification appliances with appliance circuit number and sequence. Labels to be visible from the floor without magnification.
- B. Provide protective guard where device is subject to abuse and where required by AHJ.

3.14 STROBES

- A. Provide permanent, machine-printed labels on notification appliances with appliance circuit number and sequence. Labels to be visible from the floor without magnification.
- B. Provide protective guard where device is subject to abuse and where required by AHJ.

3.15 HORNS

- A. Provide permanent, machine-printed labels on notification appliances with appliance circuit number and sequence. Labels to be visible from the floor without magnification.
- B. Provide protective guard where device is subject to abuse and where required by AHJ.

3.16 WEATHERPROOF/SURFACE BACKBOXES

- A. Provide manufacturer's weatherproof backbox listed for use in areas where the device or appliance is subject to humidity in excess of listed rating.
- B. Provide manufacturer surface backboxes where devices cannot be installed recessed.

3.17 CIRCUIT CONDUCTORS

- A. Provide wiring to meet the requirements of national, state and local electrical codes. Provide color coded wiring as recommended and specified by the fire alarm and detection system manufacturer.
- B. Provide Type FPLR cable when in a riser application or FPLP cable when installed in plenums.

3.18 SURGE PROTECTIONS

- A. Install in accordance with IEEE C62.41 B3 combination waveform and NFPA 70; except for optical fiber conductors.

3.19 BATTERIES

- A. Provide permanent, machine-printed label with installation date and battery manufacture date (MM/DD/YYYY).

3.20 LOCKS AND KEYS

- A. Deliver keys to Owner.

END OF SECTION