

OREGON METRO METRO OCC DOOR ACCESS CONTROL

BID SET

Integrus Project No. 22329.00

**Volume 1 of 1
Divisions 00-28**

PREPARED BY:

Integrus
A Collaboration of YGH & Integrus Architecture
707 SW Washington St
Ste. 1200
Portland, OR 97205

PREPARED FOR:

Oregon Metro
Portland, OR

February 28, 2025

VOLUME 1

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS – not included, uno

001010	TABLE OF CONTENTS - included
001116	INVITATION TO BIDDERS
002113	INSTRUCTIONS TO BIDDERS
003100	AVAILABLE PROJECT INFORMATION
004113	BID FORM
007200	GENERAL CONDITIONS
007343	WAGE RATE REQUIREMENTS

DIVISION 01 - GENERAL REQUIREMENTS

011000	SUMMARY
012000	PRICE AND PAYMENT PROCEDURES
012500	SUBSTITUTION PROCEDURES
012500A	SUBSTITUTION REQUEST FORM
012600	CONTRACT MODIFICATION PROCEDURES
013100	PROJECT MANAGEMENT AND COORDINATION
013115	COMMUNICATION
013119	PROJECT MEETINGS
013216	CONSTRUCTION PROGRESS SCHEDULE
013300	SUBMITTAL PROCEDURES
013300A	CONSENT FOR THE RELEASE OF ELECTRONIC MEDIA
013546	INDOOR AIR QUALITY PROCEDURES
014000	QUALITY REQUIREMENTS
015000	TEMPORARY FACILITIES AND CONTROLS
016000	PRODUCT REQUIREMENTS
017000	EXECUTION
017419	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
017700	CLOSEOUT PROCEDURES
018113	SUSTAINABLE DESIGN REQUIREMENTS

DIVISION 02 – EXISTING CONDITIONS

024100	DEMOLITION
--------	------------

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

079200	JOINT SEALANTS
--------	----------------

DIVISION 08 – OPENINGS

081213	HOLLOW METAL FRAMES
081314	HOLLOW METAL DOORS
087100	DOOR HARDWARE

DIVISION 09 – FINISHES

099000 PAINTING AND COATING

DIVISION 26 – ELECTRICAL

260500 COMMON WORK RESULTS FOR ELECTRICAL
260519 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
260526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
260529 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
260533 RACEWAYS, BOXES AND CONDUITS FOR ELECTRICAL SYSTEMS
260553 IDENTIFICATION FOR ELECTRICAL SYSTEMS
262000 LOW-VOLTAGE ELECTRICAL DISTRIBUTION
262816 ENCLOSED SWITCHES AND CIRCUIT BREAKERS

DIVISION 27 - COMMUNICATIONS

270200 COMMUNICATIONS GENERAL REQUIREMENTS
270528 PATHWAYS FOR COMMUNICATIONS SYSTEMS
271500 COMMUNICATIONS HORIZONTAL CABLING

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

280000 ELECTRIC SAFETY AND SECURITY BASIC REQUIREMENTS
281000 ACCESS CONTROL SYSTEM

END OF SECTION

DIVISION 01
GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes
 - 1. Description of the Work.
 - 2. Contract description.
 - 3. Project Contacts.
 - 4. Work by Owner or other.
 - 5. Owner-furnished products.
 - 6. Contractor's use of site and premises.
 - 7. Work sequence.
 - 8. Owner occupancy.
 - 9. Permits.
 - 10. Ecological Requirements.
 - 11. Existing Conditions.
 - 12. Archeological Findings.
 - 13. Terms and Definitions.
 - 14. Specification conventions.

1.2 PROJECT

- A. Project Name: Oregon Metro OCC Door Access Control.
- B. Project Location: Oregon Convention Center (OCC), 777 NE Martin Luther King Jr Blvd, Portland, OR 97232.
- C. The Project consists of Door access control upgrades, door hardware upgrades, and selected door renovations to doors throughout building.

1.3 CONTRACT DESCRIPTION

- A. Perform Work of Contract under stipulated sum Contract with Owner according to Conditions of Contract.
- B. Contract Type: A single prime contract based on a Stipulated Price as described in Document 005200 - Agreement Form.

1.4 PROJECT CONTACTS

- A. Owner: Metro, 600 NE Grand Ave., Portland, OR 97232-2736
- B. Architect: Integrus Architecture, 707 SW Washington St., Suite 1200, Portland, OR 97205, 503.221.0150.

1.5 WORK BY OWNER

- A. If Owner-awarded contracts interfere with each other due to work being performed at the same time or at the same Site, Owner will determine the sequence of work under all contracts according to "Work Sequence" and "Contractor's Use of Site and Premises" Articles in this Section.
- B. Contractor is responsible for scheduling the work, storing such equipment if requested, and coordinating related work in the Contract with installation of NIC and OFOI equipment.
- C. Contractor shall provide all preparatory work necessary for proper installation including blocking and backing, and finish work including caulking, grouting, furring, and painting adjacent surfaces as required for NIC and OFOI equipment. Confirm with Owner work to be done.
- D. The Owner will employ a special inspector to perform the special inspections required as indicated on the drawings.

1.6 OWNER-FURNISHED PRODUCTS

- A. Items noted 'OFOI' (Owner Furnished, Owner Installed) will be furnished and installed by Owner as is appropriate to the flow of the work, and 'OFCI' (Owner Furnished, Contractor Installed) will be furnished to the Contractor by the Owner for the Contractor to install. Items noted 'NIC' (Not in Contract) are not in contract and will be provided by others.
- B. Owner's Responsibilities:
 - 1. Arrange for and deliver Owner-reviewed Shop Drawings, Product Data, and Samples to Contractor.
 - 2. Arrange and pay for delivery to Site.
 - 3. Upon delivery, inspect products jointly with Contractor.
 - 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - 5. Arrange for manufacturers' warranties, inspections, and service.
 - 6. Stocking of supplies.
 - 7. The Owner will install systems into conduit and structures provided under this contract.
- C. Contractor's Responsibilities:
 - 1. Review Owner-reviewed Shop Drawings, Product Data, and Samples.

2. Receive and unload products at Site; inspect for completeness or damage jointly with Owner.
3. Handle, store, install, and finish products.
4. Contractor is responsible for scheduling the work, storing such equipment if requested, and coordinating related work in the Contract with installation of NIC and OFOI equipment.
5. Contractor shall provide all preparatory work necessary for proper installation including blocking and backing, and finish work including caulking, grouting, furring, and painting adjacent surfaces as required for NIC and OFOI equipment. Confirm with Owner work to be done.
6. Repair or replace items damaged after receipt.

1.7 OWNER OCCUPANCY

- A. Owner intends to continue to occupy adjacent portions of the existing building.
- B. Owner intends to occupy the Project upon Substantial Completion.
- C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- D. Owner's use and occupancy of designated areas before Substantial Completion of the entire Project do not relieve Contractor of responsibility to maintain specified insurance coverages on a 100 percent basis until date of final payment.
- E. Schedule the Work to accommodate Owner occupancy.

1.8 CONTRACTOR USE OF SITE AND PREMISES

- A. Assume full responsibility for the protection and safekeeping of tools, equipment, materials, and products under this Contract, stored on the site.
- B. Assume full responsibility for site security and safety.
- C. Construction Operations: Limited to areas noted on Drawings.
- D. Limit use of Site and premises to allow:
 1. Owner occupancy.
 2. Work by Owner.
 3. Work by Others.
 4. Use of Site and premises by the public.
- E. 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.

F. Construction Operations:

1. On-Site work hours: Construction on the Project Site is limited to 7 am to 5 pm, Monday through Friday, unless Work at other times is approved in advance by the Project Manager.
2. Noisy and Disruptive Operations (such as Use of Jack Hammers and Other Noisy Equipment): Not allowed in close proximity to existing building during regular hours of operation. Coordinate and schedule such operations with Owner to minimize disruptions.
3. Provide positive means to prevent air-borne dust from dispersing into atmosphere and surrounding environment. Cover stockpiled material with tarps, wet down, and take other measures appropriate to minimize raising dust from construction operations..

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

H. Utility Outages and Shutdown:

1. Coordinate and schedule electrical and other utility outages with Owner.
2. Prevent accidental disruption of utility services to other facilities.
3. At least one week before scheduled outage, submit Outage Request Plan to Architect/Engineer itemizing the dates, times, and duration of each requested outage.

I. Sound Level Restrictions: Comply with all applicable state and local laws, ordinances, and regulations relative to noise control. Sound pressure level measured at boundary of Site shall not exceed 60 dBA.

J. Construction Plan: Before start of construction, submit Electronic copy of construction plan regarding access to Work, use of Site, and utility outages for acceptance by Owner. After acceptance of plan, construction operations shall comply with accepted plan unless deviations are accepted by Owner in writing.

K. Keep work and storage areas in a neat, clean and orderly condition at all times. Should it be necessary at any time to move materials, Contractor shall move same at his expense.

L. Contractor is responsible for damage to existing property adjacent to the project site and at completion of all work, shall restore/return existing property to its original condition as it was prior to start of project work.

M. Smoking is prohibited in all areas of the Project Site except in designated smoking areas. Contractor and Project Manager to determine a designated smoking area.

1.9 WORK SEQUENCE

A. Construct Work in stages during the construction period. Coordinate construction schedule and operations with Architect and Owner.

1. Phase 1: Admin.

- B. Sequencing of Construction Plan: Before start of construction, submit Electronic copy of construction plan regarding phasing of demolition and new Work for acceptance by Owner. After acceptance of plan, construction sequencing shall comply with accepted plan unless deviations are accepted by Owner in writing.
- C. Coordinate construction schedule and operations with Owner.

1.10 PERMITS

- A. The Owner will pay for:
 - 1. Plan check fees.
 - 2. Building Permit.

1.11 ECOLOGICAL REQUIREMENTS

- A. Conform to Oregon State Department of Ecology and with local codes and guidelines regarding pollution control, waste reduction and recycling.
- B. Contractor is responsible for securing applicable environmental control permits from all authorities having jurisdiction over construction practices.

1.12 EXISTING CONDITIONS

- A. Utilities of record require field verification and identification. Where unknown utility lines are encountered, protect from damage and do not assume abandoned before identification is made by utility company. Notify Architect of unauthorized cutting or other damage to utility lines resulting from construction activity and promptly take such measures as directed to make reparation.
- B. Surveys and reports of existing topographical and subsurface conditions, including locations of utilities, are provided without warranty as to their accuracy or completeness and are intended as general reference to probable conditions.
- C. Where existing conditions differ from that indicated by Contract Documents:
 - 1. Document and notify Architect immediately of differing conditions.
 - 2. Coordinate and distribute corrections prior to preparing Shop Drawings and before beginning work dependent upon accurate knowledge of conditions.

1.13 TERMS AND DEFINITIONS

- A. The term 'indicated' is a cross reference to details, notes or schedules on the drawings, other paragraphs or schedules in the Project Manual, and similar means of recording requirements in the contract documents.
- B. Where terms such as 'shown,' 'noted,' 'scheduled' and 'specified' are used in lieu of 'indicated,' it is for the purpose of helping the readers accomplish the cross reference and no limitation of location is intended except as specifically noted.

- C. Where not otherwise explained, terms such as 'directed,' 'requested,' 'authorized,' 'selected,' 'approved,' 'required,' 'accepted,' and 'permitted' mean 'directed by the Architect,' 'requested by the Architect,' etc. However, no such implied meaning will be interpreted to extend the Architect's responsibility into the Contractor's area of construction supervision.
- D. The meaning of the word 'approve,' where used in conjunction with Architect's response to submittals, requests, applications, inquiries, reports and claims by Contractor, will be held to limitations of Architect's responsibilities and duties as specified in the Conditions of the Contract. In no case will 'approval' by Architect be interpreted as a release of Contractor from responsibilities to fulfill requirements of the Contract Documents.
- E. The word 'installer' is a person or entity engaged by the Contractor or his subcontractor or sub-subcontractor for the performance of a particular unit of work at the project site, including installation, erection, application and similar required operations. It is a general requirement that Installers be recognized experts in the work they are engaged to perform.
- F. The word 'provide' means to furnish and install.

1.14 SPECIFICATION CONVENTIONS

- A. These Specifications are written in imperative mood and streamlined form. This imperative language is directed to Contractor unless specifically noted otherwise. The words "shall be" are included by inference where a colon (:) is used within sentences or phrases.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 011000

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Procedures for preparation and submittal of applications for progress payments.
 - 2. Schedule of Values.
 - 3. Application for Payment.
 - 4. Documentation of changes in Contract Sum and Contract Time.
 - 5. Defect Assessment.

1.2 SCHEDULE OF VALUES

- A. Use Schedule of Values Form: AIA G703.
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.
- C. Forms filled out by hand will not be accepted.
- D. Submit electronic file of schedule on AIA G703 - Continuation Sheet for G702.
- E. Submit Schedule of Values within 15 days after the Notice to Proceed.
- F. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section.
- G. Show line items of indirect costs, and margins of actual costs, only to extent such items will be individually listed in payment requests. In general, establish each item in schedule of values (and in payment requests) to be complete with its total expenses and proportionate share of general overhead and profit margin.
- H. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.
- I. Revise schedule to list approved Change Orders, with each Application For Payment.
- J. Provide at least one line item for each listed specification section beginning with Division 2. Coordinate applicable activities with Section 013216 - Construction Progress Schedule.
- K. List separate line items for General, Mechanical, and Electrical close-out (which includes Operation and Maintenance manuals) and include the dollar amount equal to 2% of each portion of the contract.
- L. Round-off line item amounts to nearest whole dollar.
- M. Identify "Separately Funded Work" and amounts.

1.3 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Submit electronic file to of each Application for Payment on AIA G702 - Application and Certificate for Payment and AIA G703 - Continuation Sheet for G702.
- C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- D. Forms filled out by hand will not be accepted.
- E. Execute certification by signature of authorized officer.
- F. Submit one electronic and three hard-copies of each Application for Payment.
- G. Application for Initial Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 - 1. Statement of Intent to Pay Prevailing Wages on Public Works Contract on form issued by the State of Oregon, Bureau of Labor and Industries.
 - 2. List of subcontractors including phone numbers, business address, and contact person.
 - 3. Schedule of Values.
 - 4. Contractor's Construction Schedule (preliminary if not final).
 - 5. Products list.
 - 6. Schedule of Unit Prices, as applicable.
 - 7. Submittals Schedule (preliminary if not final).
 - 8. Initial progress report.
 - 9. Certificates of insurance and insurance policies.
 - 10. Performance and payment bonds.
 - 11. List of emergency contact information.
 - 12. Other documents as may be required in the Contract Documents.
- H. Draft Payment Application:
 - 1. Submit prior to each application of payment.
 - 2. Prepare the actual payment request after the draft amounts are reviewed and agreed to by the Architect and Owner.

- I. Application for Monthly Payment: Submit on date each month as agreed between Owner and Contractor.
 - 1. Content and Format: Use Schedule of Values for listing items in Application for Payment.
 - 2. Submit updated construction schedule with each Application for Payment.
 - 3. Payment Period: Submit at intervals stipulated in the Agreement.
 - 4. Submit submittals with transmittal letter as specified in Section 013300 - Submittal Procedures.
- J. Substantiating Data: When Architect/Engineer requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:
 - 1. Current construction photographs specified in Section 013300 - Submittal Procedures.
 - 2. Partial release of liens from major Subcontractors and vendors.
 - 3. Record Documents as specified in Section 017000 - Closeout Procedures, for review by Owner, which will be returned to Contractor.
 - 4. Affidavits attesting to off-Site stored products.
 - 5. Construction Progress Schedule, revised and current as specified in Section 013300 - Submittal Procedures.
- K. Contract Retainage Value: The Owner shall pay 95% of the amount due the Contractor on account of progress payments. The remaining 5% of each payment amount shall be held as retainage until Substantial Completion at which time the retained funds will be paid to the Contractor as referenced in General Conditions Article 9 Payments and Completion for additional information. Any remaining funds will be held until final completion and will be paid to the Contractor with the Final Payment.
- L. Application at time of Substantial Completion: Show one hundred percent (100%) completion for portion of the Work claimed as substantially complete.
 - 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 - 2. Submit documentation that Waste Management goals (017419) have been met.
- M. Application for Final Payment:
 - 1. Complete and submit accepted documents as required by the General Conditions of the Contract for Construction.

1.4 DEFECT ASSESSMENT

- A. Replace the Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of Architect/Engineer, it is not practical to remove and replace the Work, Architect/Engineer will direct appropriate remedy or adjust payment.

- C. Individual Specification Sections may modify these options or may identify specific formula or percentage sum/price reduction.
- D. Authority of Architect/Engineer to assess defects.
- E. Nonpayment for Rejected Products: Payment will not be made for rejected products for any of the following reasons:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined as unacceptable before or after placement.
 - 3. Products not completely unloaded from transporting vehicle.
 - 4. Products placed beyond lines and levels of the required Work.
 - 5. Products remaining on hand after completion of the Work.
 - 6. Loading, hauling and disposing of rejected products.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 012000

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes
 - 1. Quality assurance.
 - 2. Product options.
 - 3. Product substitution procedures.
 - 4. Substitution Request Form.

1.2 DEFINITIONS AND OPTIONS

- A. Performance, Reference Standard, and Descriptive Specifications:
 - 1. Manufacturer is not specified and requirements are specified purely by descriptive requirements, design requirements, performance requirements, reference standards, or codes.
 - 2. Products and options meeting or exceeding specified provisions are accepted.
- B. Open Proprietary Specifications:
 - 1. Products by one or more manufacturers are specified and specification makes provision for substitution requests.
 - 2. Conform to provisions for making substitution request as specified by this Section.
- C. Closed Proprietary Specifications:
 - 1. Products by one or more manufacturers are specified and specification Section does include provision for substitution requests.
 - 2. Provide work as specified. No substitution will be accepted.
- D. Basis -of -Design Specifications:
 - 1. Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.
 - 2. Provide either the specified product or a comparable product by one of the other named acceptable manufacturers. Drawings and specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with Comparable Product definition below. Substitutions will be considered only when Section 012500 Substitution Procedures is referred to.

- E. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

1.3 QUALITY ASSURANCE

- A. Contract is based on products and standards established in Contract Documents without consideration of proposed substitutions.
- B. Products specified define standard of quality, type, function, dimension, appearance, and performance required.
- C. Substitution Proposals: Permitted for specified products except where specified otherwise. Do not substitute products unless substitution has been accepted and approved in writing by Owner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
 - 4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 5. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer. Include:
 - 1. Manufacturer's name and address, product, trade name, model, or catalog number, performance and test data, and reference standards.
 - 2. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.

3. Itemized point-by-point comparison of proposed substitution with specified product, listing variations in quality, performance, and other pertinent characteristics.
 4. Reference to Article and Paragraph numbers in Specification Section.
 5. Cost data comparing proposed substitution with specified product and amount of net change to Contract Sum.
 6. Changes required in other Work.
 7. Availability of maintenance service and source of replacement parts as applicable.
 8. Samples when applicable or requested.
 9. Submit list of at least 3 projects where proposed substitution has been used within past 12 months. Include name, address, and telephone number of Owner and Architect.
 10. Other information as necessary to assist Architect/Engineer's evaluation.
- C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.
 2. Submit electronic files of Request for Substitution for consideration. Limit each request to one proposed substitution.
- D. Limit each request to a single proposed substitution item.

3.2 SUBSTITUTION PROCEDURES DURING PROCUREMENT

- A. Substitution Requests During Bidding Phase
1. Submit Substitution Request to reach Architect's office before 5 p.m. at least 10 working days prior to date for receiving Bids.
 2. Bidders will be notified of accepted substitutions by Addendum. No other form of acceptance is valid, including as stated verbally, written, emailed, faxed, or implied in other manner and bidders shall not rely upon any approval not incorporated into the Contract Documents in this manner.
- B. Submittal Form (before award of contract):
1. Submit substitution requests by completing the form attached to this section. See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.

3.3 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

- A. Substitution Requests During Construction

1. Submit Substitution Requests directly by or through Contractor to Architect.
 2. Substitution Requests following Bid Date will not be considered, except at discretion of Owner and subject to reimbursement for Architect's review. Review fee will apply whether or not substitution request is accepted.
 - a. Exception: Substitution Requests may be reviewed in the event of special circumstances beyond Contractor's control. Reason for substitution request must be submitted on the attached Substitution Request Form.
 3. Reasons for consideration of substitutions include:
 - a. Unavailability: Specified item has been discontinued; there are no available qualified installers; or lead-time is prohibitive relative to project schedule.
 - b. Unsuitability: Subsequent information discloses specified item as unsuitable, inappropriate, unable to perform properly, or to fit designated space.
 - c. Regulatory Requirements: Specified item fails to conform to building code interpretations or insurance regulations.
 - d. Warranty: Manufacturer or fabricator has declared that specified item is unsuitable for intended use or refuses to certify or warrant performance of specified item for condition of use.
 - e. Owner Prerogative: As requested by Owner for reduction of Contract Cost or Contract Time.
 4. Contractor will be notified by Architect on the form provided by the Contractor within two weeks of receipt of request, of decision to accept or reject Substitution Request.
- B. Submittal Form (after award of contract):
1. Submit substitution requests by completing the form attached to this section. See this section for additional information and instructions. Use only this form; other forms of submission are unacceptable.

3.4 RESOLUTION

- A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
- B. Architect will notify Contractor in writing of decision to accept or reject request.

3.5 ACCEPTANCE

- A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.6 UNACCEPTABLE SUBSTITUTIONS

- A. Substitutions not accepted in writing by Architect.
- B. Substitutions that are not submitted on Substitution Request Form or facsimile following this Section.
- C. Substitution Requests that do not provide complete, adequate, or clearly defined information for a thorough and timely evaluation.
- D. Substitutions that, if accepted, will require substantial revisions to Contract Documents.
- E. Substitutions that are shown or implied by shop drawings and other submittals.
- F. Substitutions not accepted by published Addenda during Bidding Period and not accepted in writing by Architect during Construction Period.
- G. Substitutions installed into the Work and not accepted by Architect, constitute non-conforming work and may be rejected by Owner without further discussion or explanation.

3.7 CLOSEOUT ACTIVITIES

- A. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

3.8 ATTACHMENTS

- A. A facsimile of the Substitution Request Form required to be used on the Project is included after this section.

END OF SECTION 012500

This page intentionally left blank

SUBSTITUTION REQUEST FORM

TO: _____

PROJECT: _____

SPECIFIED ITEM: _____

Section	Page	Paragraph	Description
---------	------	-----------	-------------

The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: _____

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes description of changes to Contract Documents that the proposed substitution will require for its proper installation.

Attach list of at least 3 projects where proposed substitution has been used within past 12 months. Include name, address, and telephone number of Owner and Architect.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on Drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Submitted by:

Name (Printed)

Signature

Firm Name

Address

City, State, Zip

Date

Telephone
Attachments:

For use by the A/E:

☐ Accepted

☐ Accepted as
noted

☐ Not Accepted

☐ Received too
late

By

Date

Remarks

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Initial Requirements
 - 2. Initiating and Proposing Changes
 - 3. Architect's Supplemental Instructions
 - 4. Documentation of Change in Contract Sum and Contract Time.
 - 5. Approval or Rejection of Proposal
 - 6. Construction Change Directive
 - 7. Change Order
 - 8. Allowance for Overhead and Profit
 - 9. Correlation of Contractor Submittals

1.2 INITIAL REQUIREMENTS

- A. Within 30 days of the Notice to Proceed, the Contractor shall submit a list of all equipment anticipated to be used on the project and whether it is owned or to be rented, using a form acceptable to the Architect and Owner. If during the construction process additional equipment is brought to the Project site, the Contractor shall submit an updated list.
- B. Submit name of individual authorized to receive Change Documents, and to be responsible for informing others in Contractor's employ and to applicable subcontractors of changes to the Work.

1.3 INITIATING AND PROPOSING CHANGES

- A. Proposal Request: Issued by the Architect to the Contractor on the Owner's behalf including a detailed description of proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with stipulation of overtime work required and the period of time during which the requested price will be considered valid. Contractor will prepare and submit estimate within seven days.
 - 1. Proposal Requests are for information only. Do not consider them as an instruction (direction) either to stop work in progress or to execute the proposed change.
- B. Contractor Initiated Change Request: Describe proposed change and its full effect on the Work. Include a statement describing reason for the change, and effect on Contract Sum and Contract Time with full documentation and a statement describing effect on Work by separate or other Contractors. Document requested substitutions in accordance with Section 012500 - Substitution Procedures.

1. Contractor is to do no work on the proposed change until the Change Request is formalized by a Construction Change Directive or Change Order.

1.4 ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS (ASI)

- A. The Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or Contract Time, on a form prepared by the Architect. If the Contractor believes a cost is associated with the supplemental instructions, the Contractor is to provide written notice to the Architect within 7 days of receipt of the instructions, outlining all associated costs as outlined in Part 1.5 DOCUMENTATION OF CHANGE IN CONTRACT SUM AND CONTRACT TIME.

1.5 DOCUMENTATION OF CHANGE IN CONTRACT SUM AND CONTRACT TIME

- A. Change Order Proposal (COP): Submit electronically information required for Architect's evaluation of proposed changes.
- B. Contract Time: No additional funds will be issued or considered payable to the Contractor for time extension claims prior to Substantial Completion; the end of documented Contract Time as specified in the Metro Construction Manager/General Contractor Agreement.
- C. Support each lump sum proposal quotation, and each unit price (not previously established) with sufficient substantiating data.
 1. On request, provide additional data to support time and cost computations:
 - a. Labor required.
 - b. Equipment required.
 - c. Products required.
 - 1) Recommended source of purchase and unit cost.
 - 2) Quantities required.
 - d. Taxes, insurance, and bonds.
 - e. Documented credit for work deleted from Contract.
 - f. Overhead and profit.
 - g. Justification for any change in Contract Time.
 2. Submit additional substantiating data to support computations, as requested by Architect.
 3. Support each proposal for additional costs, and time-and-material work, with documentation, as required for lump-sum proposal. Include additional information:
 - a. Name of Architect or Owner's authorized agent who ordered work, and date of order.

- b. Dates and times work was performed, and by whom (firm or individual).
- c. Time record, summary of hours worked, and hourly rates paid.
- d. Receipts and invoices for:
 - 1) Equipment used, listing dates and times of use.
 - 2) Products used and listing of quantities.
 - 3) Subcontracted work.
- 4. Document Requests for Substitutions.
- 5. Statement as to whether overtime work is, or is not, necessary.

1.6 APPROVAL OR REJECTION OF PROPOSAL

A. When change is initiated by Architect or Owner:

- 1. Contractor to submit a detailed proposal in writing. Quotation (cost estimate) must be guaranteed for period specified in Proposal Request beginning from signing of proposal. If no period is specified, guarantee quotation for sixty (60) days from signing.
- 2. Architect and/or Owner will review the proposal and respond in writing with one of the following:
 - a. Request for additional information.
 - b. Approval to be issued by CCD for subsequent inclusion in a Change Order.
 - c. Rejection of the proposal and direction to continue with contracted work.
- 3. Contractor may not proceed with the proposed changed work until a signed CCD or Change Order is received from the Owner.

B. When a change proposal is initiated by Contractor:

- 1. The Architect and/or Owner will review it and respond in writing with one of the following:
 - a. Approve the Contractor's cost proposal;
 - b. Request additional information;
 - c. Reject the proposal.
- 2. If the Owner responds by approving the Contractor's change proposal, a CCD will be processed.
 - a. If additional information is requested by Owner, respond in writing within fifteen (15) days of Owner's request.

C. Concurrence of the Building Official:

1. Note that all significant modifications to the Contract Documents reviewed by the AHJ, including Change Orders “approved” by the Architect and Owner, must also be approved by the Building Official.
2. Any significant changes, such as structural changes and life safety modifications, will be submitted for review and approval to the AHJ. Contractor may not proceed with such work until the AHJ has reviewed the change and indicated that it is acceptable.

1.7 CONSTRUCTION CHANGE DIRECTIVE (CCD)

A. Construction Change Directive:

1. May be issued by Architect with Owner’s approval, instructing Contractor to proceed with change in the Work, for subsequent inclusion in a Change Order.
2. Will describe changes in work, and will designate method of determining change in Contract Sum or Contract Time.

B. Contractor: Promptly execute change to the Work.

C. Claims for Adjustments to Contract Time or Contract Sum:

1. Burden of proof is upon Contractor to submit data substantiating requested increase of Contract Sum and Contract Time for inclusion into approved Change Order.
2. Submit claims within 30 days after completion of Construction Change Directive. Claims after this time are invalid.

D. Overhead and Profit for Change to Contract Sum: Conform to provisions of Contract Documents, including the General Conditions.

E. Prevailing Wages: Limit direct costs for labor, wages, and fringe benefits to amounts indicated by Conditions of the Contract including the General Conditions and prevailing wage rate requirements.

1.8 CHANGE ORDER (CO)

A. Stipulated Sum Change Order

1. Based on Proposal Request and Contractor’s fixed maximum price quotation or Contractor’s request for change.
2. Execute Change Order for changes to the Work affecting Contract Sum or Contract Time.

B. Time and Material Change Order

1. Submit itemized account and supporting data after completion of change, within time limits indicated in Conditions of the Contract.
2. Allowable Change to Contract Sum and Contract Time: As determined by Architect under provisions of Contract Documents, including the General Conditions.

- 3. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.
- C. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in Conditions of the Contract.

1.9 CORRELATION OF CONTRACTOR SUBMITTALS

- A. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
- B. Promptly revise progress schedules and applicable sub-schedules to reflect change in Contract Time and to adjust times for other items of work affected by the change, and resubmit.
- C. Promptly enter changes in Project Record Documents.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION 012600

This page intentionally left blank

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Construction Organization.
 - 2. Cooperation and Coordination of Work.
 - 3. Project Coordination and Scheduling Control.
 - 4. Health and Safety Program.
 - 5. Mechanical and Electrical Coordination.
 - 6. Job Site Field Measurements And Templates.
 - 7. Dimensions.
 - 8. Intent of Drawings.
 - 9. Interferences and Right of Way.
 - 10. Notification and Correction of Defective Work.
 - 11. Coordination Utilities.
 - 12. Closeout Coordination.

1.2 GENERAL COORDINATION REQUIREMENTS

- A. Coordinate scheduling, submittals and work identified in the Contract to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.
- B. Coordinate work between all Sections of Contract Documents to avoid conflicts and omissions. Take special care to coordinate work indicated as Architectural, Mechanical, Electrical and other major Divisions of the Contract Documents.
- C. Responsibility
 - 1. The Contractor shall be in charge of this Contract and the site, as well as the directing and scheduling of all Work. Contractor shall be on site at all times work of this Contract is in progress. Do not delegate responsibility for coordination to any subcontractor.
 - 2. Anticipate interrelationship of all subcontractors and their relationship with the total Work.
 - 3. Resolve differences or disputes between subcontractors and materials suppliers concerning coordination, interference, or extent of Work between Sections. Contractor's decisions, if consistent with Contract Document requirements, shall be final.

4. Final responsibility for the performance, interface, and completion of the Work and the Project in accordance with the Contract Documents shall be with the Contractor.
- D. Prior to any work beginning on the site, the Contractor shall submit, and receive final approval on:
 1. Construction schedule;
 2. All required plans, including, but not limited to, safety, demolition, quality control, waste management and indoor air quality.
 3. All materials to be used on the project in accordance with Section 013300 - Submittal Procedures.

1.3 SPECIAL COORDINATION

- A. There are occupied spaces outside of the limits of construction. These spaces will not be vacated for construction during this contract. Any work in these surrounding areas must be coordinated with the Owner and the occupants of the adjacent areas.
- B. Additional special requirements and conditions apply to the work of this contract. Refer to Section 015000 - Temporary Facilities and Controls, for detailed description of these additional requirements and conditions.
- C. The Owner may require access to the site to perform work related or unrelated to the project. The Contractor shall coordinate with the Owner to accommodate such work within the contract time.

1.4 COORDINATION SHOP DRAWINGS

- A. Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
 1. Indicate relationship of components shown on separate Shop Drawings.
 2. Indicate required installation sequences.

1.5 CONSTRUCTION ORGANIZATION

- A. On-Site Lines Of Authority & Communications: Refer to Section 013115 - Communication.
- B. Intra-Project Communications:
 1. Submittals.
 2. Reports and records.
 3. Recommendations.
 4. Coordination drawings.

5. Schedules.
 6. Resolution of conflicts.
- C. Construction Mobilization
1. Cooperate with the Owner's Representative in allocation of mobilization areas of the site; for field offices and sheds, for access, traffic and parking facilities.
 2. Comply with Architect and Owner's Representative's procedures for intra-project communications.
 3. Coordinate field engineering and layout work under instructions of Owner's Representative.
- D. Coordination of Reports/Activities: Coordinate both the procedural timing and the listing (naming and sequencing) of reports/activities required by provisions of this Section and other sections, to afford consistency and logical coordination between submitted reports or lists. Maintain coordination and correlation between separate reports by updating at monthly or shorter time intervals. Distribute each report and updated report to entities involved in the work, including Architect and Owner's Representative. In particular, provide close coordination of Progress Schedule, Schedule of Values (see Section 012000 - Price and Payment Procedures), listing of subcontracts, schedule of submittals, progress reports, and payment requests.
- E. Coordination of Submittals
1. Schedule and coordinate submittals specified in the Contract Documents.
 2. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to and placing equipment in service.
 3. Coordinate request for substitutions to assure compatibility of space, operating elements, and effect on work of other Sections.
- F. Coordination & Pre-Installation Meetings: Refer to Section 013119 - Project Meetings.
- G. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into the Work.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 COOPERATION & COORDINATION OF WORK

- A. The Contractor is responsible for the coordination of the work of all trades; coordinating the installation of their work and that of all subcontractors to ensure compliance with the Contract Documents and to expedite the progress of the Project. Contractor shall check specifications, addenda, and drawings covering all trades as the work progresses. Contractor shall promptly report to the Architect what they consider omissions, conflicts or points requiring clarification.
- B. Contractor shall prepare and distribute to each entity performing work at project site, a written memorandum of instructions on required coordination activities, including required notices, reports and attendance at meetings.
- C. Enclosure of the Work: The Contractor shall coordinate enclosure of work with required inspections and tests, so as to avoid the necessity of uncovering work for that purpose.
- D. It is the responsibility of the Contractor to ensure that the work of subcontractors complies with Conditions of the Contract, Division 1 - General Requirements, and the work of other Sections related to their own work. No additional payments or time extensions will be authorized for failure on the part of subcontractors to be familiar with and in compliance with the aforementioned specification divisions and sections.
- E. Inclusion of portions of the work under particular divisions of the specifications or sections of the drawings does not in every case conform to the categories of work customarily subcontracted to particular crafts or trades. In such cases, the Contractor shall be responsible to inform bidders, subcontractors, crafts and trades, that work assigned to them is contained in sections other than the usual. In every case, the General Contractor shall be responsible to provide at its cost, all work required in the Contract Documents.
 - 1. Provide project interface and coordination as required to properly and accurately bring together the several parts, components, systems, and assemblies and as required to complete the Work and the Project.
 - 2. Provide interface and coordination of all trades, crafts, and subcontracts as required to provide correct and accurate connection of abutting, adjoining, overlapping, and related Work, and provide all anchors, fasteners, accessories, appurtenances, and incidental items as required to complete the Work properly, fully, and correctly in accordance with the Contract Documents.
 - 3. Provide additional structural components, miscellaneous metal, bracing, blocking, backing, clips, anchors, fasteners, and installation accessories as required to properly anchor, fasten, or attach materials, equipment, appliances, hardware, systems, assemblies, cabinets, and architectural features to the structure.

4. Provide equipment, appliances, fixtures, and systems requiring electrical and cabling services, rough-in, and connections, or other utilities and services, with such services, rough-in, and final connections.
5. Materials, equipment, component parts, accessories, incidental items, connections, and services required to complete the Work which are not provided by subcontractors shall be provided by the Contractor.

3.2 PROJECT COORDINATION AND SCHEDULING CONTROL

- A. The Contractor shall schedule and coordinate the work of all subcontractors on the project including their use of the site. Responsibility for coordination and close adherence to time schedules rests solely with the Contractor who shall maintain coordination and scheduling control at all times.
- B. Each subcontractor responsible to the Contractor shall cooperate diligently with the Contractor in the execution of their work so as to cause no delay in the completion of the Project. This responsibility includes the completion of all work in a timely manner. All Contractors, Prime Contractor and Subcontractors, shall diligently comply with the following requirements:
 1. Cooperate in planning and layout of the work well in advance of operations.
 2. Inform other contractors of requirements at proper time to prevent delay or revisions.
 3. Be informed on the requirements of other contractors and check own work for conflicts with the work of other contractors.
 4. Insure delivery of materials and performance of work on coordinated schedule with other contractors.
 5. Contractor shall ensure subcontractors and equipment suppliers are responsible for compatibility and completeness of the installation and operation of the equipment in their respective Specification Sections including conformance with code requirements.
 6. Attend Pre-Installation meetings identified in Section 013119.
 7. Contractor shall be represented on the job site by his superintendent at all times when there is construction going on, including the work of his subcontractors, as well as his own.
- C. Changing Subcontractors: The General Contractor shall be responsible for all the additional expenses incurred by changing subcontractors during the course of this project. These additional expenses include, but are not limited to, A/E expenses for duplicate or redundant submittals, requests for information, or any clarifications or revisions that might occur due to the fact that new subcontractor(s) have assumed responsibility for a portion(s) of the Work.

3.3 HEALTH AND SAFETY PROGRAM

- A. Health and Safety Officer

1. Prior to initiation of construction, designate in writing a Site Health and Safety Officer who shall be responsible for coordinating Contractor's Health and Safety Program. The individual so designated shall be the interface with the Project Manager on matters relating to safety and Contractor's compliance with the approved Safety Program. Owner reserves the right to accept or reject the Health and Safety Officer designated by Contractor.
- B. Develop, publish, and implement the overall Health and Safety Program for the Project. This Program shall conform to all applicable codes. Contractor shall submit the written Health and Safety Program to Owner for review and comment within fourteen (14) days after the receipt of the written Notice to Proceed. Owner's review and comment, if any, and Contractor's changes to the Health and Safety Program, based on Owner's review, if any, shall not constitute an endorsement or approval of same by Owner such that Contractor is relieved of sole responsibility for content of the Health and Safety Program and its implementation.
- C. Owner is expressly released of any implied liability therefore
- D. The Health and Safety Program shall subsequently be distributed to and implemented by Contractor's personnel, as well as its Subcontractors and Suppliers. Contractor shall fully implement and comply with the Contractor's Health and Safety Program. Under no circumstance will the contractor commence work prior to submitting and implementing the Health and Safety Program.

3.4 MECHANICAL AND ELECTRICAL COORDINATION

- A. Refer to Divisions 21-23 for Mechanical Coordination and Divisions 26 - 28 for Electrical Coordination.

3.5 JOB SITE FIELD MEASUREMENTS AND TEMPLATES

- A. Obtain field measurements required for accurate fabrication and installation of Work included in this Contract. Exact measurements are the Contractor's responsibility.
- B. Contractor shall be responsible for field verifying actual dimensions where "+/-" dimensions are indicated, or the words "field verify."
- C. Furnish or obtain templates, patterns, and setting instructions as required for installation of all Work. Verify all dimensions in the field.

3.6 DIMENSIONS

- A. Primary structural elements are dimensioned on the structural plans and details. Not all secondary dimensions are shown, such as exact door and window locations, wall configurations, slab slopes and depressions, curbs, etc. Coordination of the structure with the dimensions as shown on the Drawings and architectural items to be embedded into, or attached to the structure, is the responsibility of the Contractor. Any dimensional discrepancies between the Architectural, Structural, Mechanical and Electrical drawings shall be reported to the Owner's Representative and Architect before proceeding with the work.

3.7 INTENT OF DRAWINGS

- A. The work of the Contractor and subcontractors shall conform to the intent of the architectural and engineering drawings as reviewed by the Architect. Drawings are partly diagrammatic and do not intend to show in details all features of work. The Contractor shall carefully review the work to be performed by other trades, compare related drawings and shall thoroughly understand the building conditions affecting their work.
- B. All changes required in the work caused by failure to do so shall be at no expense to the Owner.

3.8 INTERFERENCES AND RIGHT-OF-WAY

- A. Make proper provisions to avoid interferences. Where conflicts occur, architectural and structural has right-of-way over mechanical and electrical work; concealed mechanical work has right-of-way over concealed electrical work; exposed electrical fixtures have right-of-way over mechanical fixtures.
- B. Submit conflicts which cannot be resolved by right-of-way to the Architect for direction.
- C. Submit reflected ceiling coordination plans showing work by all applicable trades for review and approval by the Architect.

3.9 NOTIFICATION & CORRECTION OF DEFECTIVE WORK

- A. Coordinate the Work of all subcontractors and make certain that, where the work of one trade is dependent upon the work of another trade, the work first installed is properly placed, installed, aligned and finished as specified or required to properly receive subsequent materials applied or attached thereto.
- B. Direct subcontractors to correct defects in substrates they install when subcontractors of subsequent materials have a reasonable and justifiable objection to such surfaces. Promptly notify the Owner's Representative and Architect of any defects or imperfections in preparatory work which will in any way affect satisfactory completion of the work.
- C. Under no condition shall a section of work proceed prior to preparatory work having been completed, cured, dried or otherwise made satisfactory to receive such related work. Do not force subcontractors to apply or install products to improperly finished product.
- D. Correction of defective work shall be the responsibility of the Contractor or subcontractor providing the defective work. Correction of work due to underlying defects shall be the responsibility of the Contractor or subcontractor providing overlying work.

3.10 COORDINATING UTILITIES

- A. Contractor shall be responsible for coordination of and shall cooperate with all utilities to be installed for service to the Project. Utilities may include, but are not limited to, natural gas, telephone, electrical, and cable television. The Contractor shall maintain communication with the utilities in order to coordinate time and requirements of the utilities' installation.

- B. Contractor shall provide all work necessary to comply with the requirements of the Contract Documents for utility work that does not meet the Contract Document requirements, or for work that is disturbed by the utility installation.

3.11 CLOSEOUT COORDINATION

- A. General
 - 1. Coordinate completion and cleanup of work by the various trades in preparation for Substantial Completion.
 - 2. After Owner occupancy of premises, coordinate access to site by the various trades involved for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.
 - 3. Assemble and coordinate closeout submittals.
- B. At completion of Work of each Subcontract, conduct inspection to assure that:
 - 1. Work is acceptable.
 - 2. Temporary facilities and debris have been removed from site.
- C. At Substantial Completion:
 - 1. Conduct inspection and prepare list of work to be completed or corrected.
 - 2. Assist Architect and Owner's Representative in inspection.
 - 3. Supervise correction and completion of Work as established in Architect's inspection reports ("punch lists").
 - 4. Obtain Certificate of Occupancy from governing authorities.
- D. At Final Completion: Assist Architect and Owner's Representative in inspection.

END OF SECTION 013100

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. General Communication.
 - 2. Emergency Communication.
 - 3. Correspondence.
 - 4. Request for Information.
 - 5. Non Compliance Notice.

1.2 GENERAL COMMUNICATION

- A. All telephone and electronic communication and other correspondence shall be between Contractor and Architect, unless otherwise noted below.
- B. Subcontractors are not to contact members of the design team directly unless explicitly agreed to by Contractor, Architect and Owner's Representative. All such contact and discussions are to be documented in writing by the subcontractor and submitted to the Architect and Owner's Representative through the Contractor.
- C. The General Contractor shall transmit problems or questions in writing using a Request for Information (RFI) form.
- D. On-Site Lines of Authority and Communications: Establish on-site lines of authority and communications including attendance at Pre-Construction Meeting and Progress Meetings as required by the Architect and Owner's Representative. All on-site lines of authority and communications shall be established through the Architect.
- E. The Architect and Owner's Representative, will typically be working during the Contractor's normal working hours as defined in Section 011000 - Summary. The Contractor shall anticipate that all communication and weekly construction meetings with these parties will occur between the hours of 8 a.m. and 5 p.m. Monday through Friday throughout the duration of the Project.
- F. No overtime payments will be authorized, or time delays allowed, for the Contractor or subcontractors efforts to communicate with the Architect and Owner's Representative outside of the normal working hours.

1.3 EMERGENCY COMMUNICATION

- A. Provide an Emergency Notification list to the Architect and to the Owner.

1. The Contractor shall provide a list of names, email addresses and numbers of staff who are capable of addressing an emergency issue that may occur outside of Contractor's normal working hours. The persons designated on the list shall be available at the project site within 60 minutes of being contacted. Provide two names for each of the following:
 - a. General Contractor
 - b. Mechanical subcontractor
 - c. Electrical subcontractor
 - d. Other major subcontractors
2. Submit the list to the Architect 5 working days prior to the Preconstruction Meeting. The Architect will include the same information for design team members and Owner representatives and distribute the list at the Preconstruction Meeting.

1.4 CORRESPONDENCE

- A. All correspondence to and from Contractor will be routed through Architect with a copy to the Owner's Representative.
- B. Include project title and Architect's project number on all correspondence.

1.5 REQUEST FOR INFORMATION (RFI)

- A. It is the Contractor's responsibility to review Contract Documents in a timely manner so that the Architect shall have sufficient time to respond to a Request for Information prior to the start of actual construction of that part of the Work.
- B. When field conditions or Contract Document contents require clarification or verification by the Architect or Architect's sub-consultants, a written RFI is to be submitted as follows:
 1. Identify the nature and location of each clarification/verification using a RFI form. Provide as a minimum the following information:
 - a. Project name and number.
 - b. Date.
 - c. Date response desired.
 - d. RFI number.
 - e. Subject.
 - f. Initiator of the question (individual and firm).
 - g. Indication of costs, if known.
 - h. Location on site.

- i. Contract drawing reference.
 - j. Contract specification section and paragraph reference.
 - k. Descriptive text.
 - l. Signature of Contractor.
 - m. Attachments, including descriptive drawings, photographs, product data, submittals, dimensions, configurations, and other information needed to clarify request.
 - n. Space for reply on same page as question.
2. Number each RFI sequentially beginning with number 001 (RFI-001). Only one question per RFI.
- a. Indicate subject by designation of GEN, MECH, ELEC or other easily identifiable discipline abbreviation.
 - b. Single subject matter, 1 item each - architectural, structural, electrical or general.
3. RFI may be hand-delivered, mailed, e-mailed or faxed, depending upon the urgency.
- C. Uses
- 1. The RFI form shall be used for interpretation or clarification of the Contract Documents only.
 - 2. Do not use the RFI form for the following. The Architect will not reply and the RFI will be returned without action.
 - a. Product or material substitutions (See Section 012500 - Substitution Procedures).
 - b. Questions relating to construction means, methods, techniques, sequences, procedures, or safety precautions. These are the Contractor's responsibilities exclusively.
 - c. Questions relating to construction schedule, coordination between trades, or division of work among subcontractors. These are Contractor's responsibilities exclusively.
 - d. Questions on contract administration procedural matters, unless they require interpretation or clarifications of the Contract Documents.
 - e. Dimensions or quantities which are shown on the Contract Documents, which can be measured or calculated from the information contained in the Contract Documents where such measurement or calculation is standard construction industry practice.
 - f. Confirmation of interpretations or clarifications previously provided by the Architect.
 - g. The Contractor shall not initiate requests for interpretations or clarifications of the Contract Documents which can be reasonably derived from a review of the Contract Documents.

- D. Route RFI's in same manner as correspondence.
- E. Clarifications may be discussed on-site or by telephone with Architect or Architect's Consultants, with concurrence of the Architect. A summary of these discussions is to be incorporated into a RFI form and submitted as written confirmation, for normal RFI processing.
- F. Reply
 - 1. The Architect will endeavor to reply to all RFI's as promptly as his work schedule allows, and generally no later than 7 working days from the day received. The Architect and/or its sub-consultants will attempt to expedite those RFI's indicated by the Contractor as being critical to the construction schedule.
 - 2. When an RFI involves a complex subject, extensive research or governmental agency contact, the Architect will inform the Contractor that additional time is required to prepare a reply. The Contractor shall cooperate and agree to reasonable additional time.
 - 3. The reply shall be a clarification or an interpretation of the Contract Documents; the reply is not an authorization of change in the Contract Sum or Time.
 - 4. Where Architect's action may affect Contract Time or Contract Sum:
 - a. Notify Architect in writing within 10 days of receipt.
 - b. Conform to Conditions of the Contract for submittal of Change Order Proposal, Section 012600 - Contract Modification Procedures.
- G. On receipt of Architect response to RFI:
 - 1. Update RFI log and promptly distribute RFI response to those affected by response.
 - 2. Review and notify Architect within 7 days if Contractor disagrees with response.
- H. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by RFI number. Submit log weekly. Include following:
 - 1. Project Name.
 - 2. Name and address of Contractor.
 - 3. Name and address of Architect.
 - 4. RFI number including those that were dropped and not submitted.
 - 5. RFI description.
 - 6. Date RFI was submitted.
 - 7. Date Architect's response was received.

8. Identification of related Minor Changes in the Work, Architect's Supplemental Instructions (ASI), Construction Change Directives (CCD), and Proposal Requests, as applicable.

- I. Note: Architect will respond only to requests for interpretation of Contract Documents originating from Contractor. The Contractor shall be deemed to be the author of all RFI's, whether written by him or one of his sub-contractors or suppliers. It is the Contractor's responsibility to ensure that all RFI's are complete and correct in form, and the Contractor shall be the contact for further information or explanation. All replies shall be directed to the Contractor, and it is his responsibility to ensure that the appropriate contractor personnel are copied or informed of the replies.

1.6 NON-COMPLIANCE NOTICE (NCN)

- A. Any work that is identified as "not in compliance" with the Contract Documents, either by oral discussion with the Contractor, or written communication to the Contractor, shall be removed and replaced without cost to the Owner, including removal of additional material necessary to confirm non-compliance. At its option, the Owner may accept written alternative solutions offered by the Contractor and recommended by the Architect. The Contractor shall notify the Architect and Owner in writing immediately following oral discussion or receipt of any written communication if the Contractor believes that the Work in question is in compliance with the Contract Documents. The Architect will make a determination based on the Contract Documents. If the Architect finds the work is in noncompliance, the Architect will issue a written Non-Compliance Notice (NCN). Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. Upon receipt of the NCN, the Contractor shall take immediate action to correct work. Review corrections at progress meetings for closure.
- B. If the Contractor fails to or refuses to comply promptly after the final determination of the appropriate corrective action, the Owner may:
 1. Issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Owner will not pay for non-complying work or follow on work until the non-complying work is corrected or replaced. If it becomes necessary to stop work due to non-correction of non-complying work, no delay claim, time extension, or compensation will be granted.
 2. Elect to correct the non-compliant work with his own forces, or those of another contractor, and back charge the Contractor by issuing a deductive Change Order, with appropriate explanation and supporting data, which the Contractor is required to sign. Should the Contractor elect not to sign the deductive Change Order, he will be deemed to be in breach of the contract and the dispute will be subject to the Dispute Resolution Procedures of the General Conditions.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION 013115

This page intentionally left blank

PART 1 GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:
 - 1. Preconstruction meeting.
 - 2. Progress meetings.
 - 3. Coordination meetings.
 - 4. Pre-installation meetings.
 - 5. Project closeout meetings.
 - 6. Owner training meetings.

1.2 PRECONSTRUCTION MEETING

- A. The Contractor will schedule a preconstruction conference before starting construction, at a time convenient to the Contractor and the Architect, but no later than 5 days after execution of the Contract. The conference will be held at the Project Site or another convenient location as selected by Owner.
- B. Attendance is required of the following:
 - 1. Architect and Architect's consultants.
 - 2. Owner's Representatives.
 - 3. Contractor's Superintendent and Project Manager; Contractor's QC Representative if different individual than the Project Manager.
 - 4. Major Subcontractors.
 - 5. Others, as requested.
- C. Discussion will cover items of significance, including the following:
 - 1. Communication chain and persons authorized to direct changes.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Submission of list of Subcontractors and preliminary progress schedule per Section 013216 - Construction Progress Schedule.
 - 4. The Work.
 - 5. Construction Team roles.
 - 6. Work hours, sequence, phasing, and occupancy.

7. Special project procedures.
 8. Procedures and processing for Application for Payments; Change Orders (CO);
 9. Requests for Information (RFI); Architect Supplemental Instructions (ASI); Field decisions; Submittals; and others as appropriate.
 10. Project record documents including review of as-builts on a regular basis during construction.
 11. Construction facilities, and controls.
 12. Temporary utilities.
 13. Safety and security procedures.
 14. Environmental and noise controls.
 15. Housekeeping and site maintenance procedures.
 16. Utility shutdowns / Outage Request Form.
 17. Site Access and Parking.
 18. Equipment deliveries and priorities.
 19. Testing Procedures.
 20. Scheduling Progress Meetings.
 21. Schedule Review.
 22. Contractor's Quality Control Program
 23. Hazardous material abatement procedures, if any.
 24. Use of site and premises by Owner and Contractor.
 25. Requirements for start-up of equipment.
 26. Inspection and acceptance of equipment put into service during construction period.
 27. Others, as appropriate.
- D. The Contractor will:
1. Conduct the meeting to review contract administration requirements.
 2. Record minutes and distribute copies within three days after meeting to participants, with copies to Architect/Engineer, Owner, and those affected by decisions made.
 3. The General Contractor shall be responsible to distribute copies to all other Contractor attendees.

1.3 PROGRESS MEETINGS

- A. For purposes of coordination and scheduling after start of the work, weekly Progress Meetings will be held to enable an orderly review of the construction progress and to provide for systematic discussion and analysis of concerns that may arise relative to execution of the work.
- B. Contractor, and Subcontractors as required, shall incorporate attendance at these meetings as part of the Base Bid of the project – no overtime payments will be authorized for Contractor or Subcontractors to attend weekly Progress Meetings or other special meetings if required.
- C. Meeting Locations: ADA accessible Contractor's project field office or Owner provided meeting room, unless otherwise agreed.
- D. Attendance: Representatives attending meetings are required to be qualified and authorized to act on behalf of their firms. Attendance shall include:
 - 1. Architect and Architect's consultants, as appropriate.
 - 2. Owner's Representatives.
 - 3. Contractor's Superintendent, Project Manager, and QC Representative.
 - 4. Subcontractors, as appropriate.
 - 5. Suppliers, as appropriate.
 - 6. Others, as appropriate.
- E. Agenda: Discussion will pertain to items, such as:
 - 1. Attendees; list of attendees and company they represent.
 - 2. Review and approve minutes of previous meeting; written corrections, additions and/or deletions to previous minutes acknowledged.
 - 3. Review of Work in Progress: Discussion and field review.
 - 4. Review Short Interval Schedule.
 - 5. Review Outages.
 - 6. Review construction schedule.
 - 7. Present corrective measures and procedures to regain project schedule, as applicable.
 - 8. Present field observations, problems, and conflicts; discuss concerns pertaining to:
 - a. Structural items.
 - b. Mechanical items.
 - c. Electrical items.

- d. Architectural items.
 - 9. Discuss problems impeding progress schedule.
 - 10. Planned progress during succeeding work period.
 - 11. Review Contractor's quality control system; discuss any concerns and corrective measures.
 - 12. Review submittal schedules and logs, present methods to expedite as required.
 - 13. Review off-site fabrication.
 - 14. Review delivery schedules.
 - 15. Review outstanding RFIs.
 - 16. Review proposed changes for:
 - a. Effect on construction schedule and on completion date.
 - b. Effect on any other contracts of the project.
 - 17. Review Change Order Proposal log and finalize prices.
 - 18. Review draft of Application for Payment (at end of month).
 - 19. Confirm status of the "as-built" drawings and review required revisions to Project Record Documents; see update requirements specified below.
 - 20. Confirm status of shop drawing submittals and approvals.
 - 21. Review project safety.
 - 22. Review Waste Management Plan.
 - 23. Review any outstanding Non-Compliance Notices.
 - 24. Review any other business.
 - 25. Confirm next meeting date, location and time plus those requested to be in attendance.
- F. Contractor will:
- 1. Administer weekly Progress Meetings throughout work progress;
 - 2. Record and distribute the following by e-mail within 3 working days after the meeting: Meeting Minutes, RFI, ASI, Submittal/Shop Drawing and Cost Change logs. Distribution to include all attendees other than those related to the General Contractor's contract. The General Contractor is responsible to distribute copies to all Contractor attendees.
 - 3. Provide paper copies of the minutes, RFI, ASI, Submittal/Shop Drawing and Cost Change logs to attendees at the next meeting.

4. Ascertain that work is prosecuted consistently with contract documents and construction schedules.
- G. At Contractor's option, weekly progress meetings can be held integrally with monthly CPM Scheduling meeting specified herein.
- H. Contractor shall be responsible to provide the following at each meeting:
 1. Current (and updated if necessary) Short Interval Schedule as specified in Section 013216 - Construction Progress Schedule.
 2. Current (and updated if necessary) submittal schedule.

1.4 COORDINATION MEETINGS

- A. Contractor shall hold weekly coordination meetings with his subcontractors and suppliers as deemed necessary by the Contractor for coordination of the work. Meetings shall be held on site. The Owner and the Architect will be available to attend such meetings upon request. Refer to Section 013100 - Project Management and Coordination for additional information and requirements pertaining to coordination meetings.
- B. The superintendent of the Contractor and prime subcontractors shall review the Contractor's schedule for the first three (3) months of work and thoroughly review the work required by the Contract Documents for that period. The Contractor shall submit Design Clarification Requests, Requests for Information, or any other type of information requests the Contractor may use, for the three (3) month work period during the first month after Notice To Proceed to minimize any conflicts that might occur when mobilization begins.
 1. This process shall continue for each three (3) months, or increments of 3 month work segments until the completion of the Project.
- C. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special pre-installation meetings.
- D. Request representation at each meeting by every trade currently involved in coordination or planning for the construction activities involved.
- E. Record meeting results and distribute copies to Architect and Owner and to others affected by decisions or actions resulting from each meeting.

1.5 PRE-INSTALLATION MEETINGS

- A. General: Prior to commencement of work listed below or as otherwise determined by the Architect or Owner, the General Contractor or his general superintendent, the responsible foremen for the subcontractors performing said work, plus all associated sub-subcontractors, suppliers, fabricators, vendors, and others as appropriate, shall attend a meeting for the purpose of establishing a full understanding of the procedures and requirements for the orderly progress of the designated work.

- B. All subcontractors and major suppliers are required to attend these pre-installation meetings prior to commencing work of their respective specifications Section, or as required by related work in other specification sections. Contractor may elect to group several Sections or Divisions to minimize the number of these meetings.
- C. Require attendance of entities directly affecting, or affected by, work of the Section including Contractor's Project Manager and Superintendent with Lead man performing the work, and/or the appropriate Subcontractors/Suppliers/Fabricators.
- D. Contractor shall notify the Architect and Owner of the Contractor's scheduled pre-installation meeting not less than seven (7) days prior to the scheduled start of any of the work listed below so that the Architect and Owner may attend at their option. All applicable submittals as well as the Subcontractor's safety plan and insurance certificates shall have been submitted to and reviewed by the Architect and Owner prior to scheduling this meeting. Refer to individual technical sections for work requiring pre-installation meetings.
- E. Contractor will record, reproduce and distribute copies of minutes prior to the next meeting or within seven (7) days of each meeting to all meeting participants.

1.6 PROJECT CLOSEOUT MEETINGS

- A. For the purpose of attaining project closeout, commencing immediately following established date of Substantial Completion, Contractor's project manager and superintendent and all subcontractors who have outstanding punch list items associated with their work, or as otherwise requested and including all subcontractors involved in the building systems commissioning process, shall attend weekly closeout meetings which shall be held at the jobsite.
- B. Such meetings shall be held to review and discuss the resolution of all punch list items in order to attain Final Completion. Closeout meetings shall continue on a weekly basis until all punch list items have been resolved and Final Completion is attained.

1.7 TRAINING MEETINGS FOR OPERATING INSTRUCTIONS OF OWNER'S PERSONNEL

- A. Refer to Section 017700 for training requirements related to operating instructions of Owner's personnel.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION 013119

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Submittals.
- B. Quality assurance.
- C. Format for network analysis schedules.
- D. Bar chart schedules .
- E. Review and evaluation.
- F. Updating schedules.
- G. Distribution.

1.2 DEFINITIONS

- A. "Day," as used throughout the Contract unless otherwise stated, means "calendar day."
- B. Float: The amount of time between the earliest finish and the latest finish date of an activity or chain of activities on the Critical Path Method (CPM) construction schedule. Float is not for the exclusive use of either the Contractor or the Owner unless otherwise identified in the Contract Documents.
Extensions of time for Contract performance will be granted only to the extent that equitable time adjustments to the affected activity or activities exceed the total float time along the affected paths of the currently approved CPM at the time Notice to Proceed was issued for the change.

1.3 SUBMITTALS

- A. All schedule submittals, including schedule updates, will be reviewed jointly by the Owner/Architect and the Contractor. Such review of the Contractor's schedules shall not constitute an approval or acceptance of the Contractor's construction means, methods, or sequencing or its ability to complete the Work in a timely manner. Neither the Owner's nor the Architect's review will relieve the Contractor of the sole responsibility for the accuracy, adequacy, or completeness of the schedule, the logic of the schedule, and/or completion of the Contract requirements in accord with such schedule. Neither Owner's nor Architect's review shall constitute acknowledgment that the relationships between various work items or activity durations are reasonable or appropriate.
- B. Within 10 days after date of Notice to Proceed, submit proposed preliminary diagram defining planned operations for first 60 days of Work, with general outline for remainder of Work.
- C. Participate in review of preliminary and complete schedules jointly with Architect/Engineer.
- D. Within 20 days after joint review of proposed preliminary schedule, submit draft of proposed complete schedule for review. Include written certification that major electrical Subcontractors have reviewed and accepted the proposed schedule.
- E. Submit updated schedules with each Application for Payment.

- F. Submit schedules under transmittal letter form specified in Section 013300 - Submittal Procedures. PDF method preferred.
- G. Schedule Updates:
 - 1. Overall percent complete, projected and actual.
 - 2. Completion progress by listed activity and sub-activity, to within five working days prior to submittal.
 - 3. Changes in Work scope and activities modified since submittal.
 - 4. Delays in submittals or resubmittals, deliveries, or Work.
 - 5. Adjusted or modified sequences of Work.
 - 6. Other identifiable changes.
 - 7. Revised projections of progress and completion.
- H. Narrative Progress Report:
 - 1. Submit with each monthly submission of Progress Schedule.
 - 2. Summary of Work completed during the past period between reports.
 - 3. Work planned during the next period.
 - 4. Explanation of differences between summary of Work completed and Work planned in previously submitted report.
 - 5. Current and anticipated delaying factors and estimated impact on other activities and completion milestones.
 - 6. Corrective action taken or proposed.

1.4 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel specializing in CPM scheduling with two years' minimum experience in scheduling construction work of complexity comparable to the Project and having use of computer facilities capable of delivering detailed graphic printout within 48 hours of request.
- B. Contractor's Administrative Personnel: two years' minimum experience in using and monitoring CPM schedules on comparable Projects.
- C. Coordination with Subcontractors and Suppliers:
 - 1. The scheduler shall prepare the Project Schedules and their updates in cooperation with major subcontractors and suppliers.

2. In scheduling work of subcontractors and deliveries by suppliers, the Contractor represents that he has agreement regarding the schedule with those supplying materials and performing the work.

D. Reliance Upon the Reviewed Schedule:

1. The Progress Schedule, as reviewed by the Architect, will be an integral part of the Contract and will establish interim completion dates for the various activities under the Contract.
2. Should any activity on the critical path not be completed within 15 calendar days after the stated scheduled date, the Owner shall have the right to require the Contractor to expedite completion of the activity by whatever means appropriate and necessary, without additional compensation to the Contractor. In addition, Contractor shall submit a "Recovery Schedule" which shall logically demonstrate method or methods Contractor proposes to get back on schedule within thirty (30) days of said date; i.e., additional tradespersons, shifts, work days, or crews.
3. In addition to above, should any activity be 15 days or more behind schedule, the Owner shall have the right to perform the activity or have the activity performed by whatever method the Owner deems appropriate.
4. Costs incurred by the Owner and the Architect in connection with expediting construction activity under this Article shall be the responsibility of the Contractor.
5. It is expressly understood and agreed that failure by the Owner to exercise the option either to order the Contractor to expedite an activity or to expedite the activity by other means shall not be considered to set a precedent for any other activities.

1.5 BAR CHART SCHEDULES

A. Format (Microsoft Project or approved software): Bar chart Schedule, to include at least:

1. Identification and listing in chronological order of those activities reasonably required to complete the Work, including:
 - a. Subcontract Work.
 - b. Major equipment design, fabrication, factory testing, and delivery dates including required lead times.
 - c. Preconstruction conferences.
 - d. Move-in and other preliminary activities.
 - e. Equipment and equipment system test and startup activities.
 - f. Project closeout and cleanup.
 - g. Work sequences, constraints, and milestones.
2. Listings identified by Specification Section number.

3. Identification of the following:
 - a. Horizontal time frame by year, month, and week.
 - b. Duration, early start, and completion for each activity and subactivity.
 - c. Critical activities and Project float.
 - d. Subschedules to further define critical portions of Work.

1.6 REVIEW AND EVALUATION

- A. Baseline Schedule: The initial Schedule when reviewed by the Architect and Owner shall be identified as the Baseline Schedule and shall be known as Revision 0. Each subsequent reviewed change to the Schedule shall be as a Revision numbered in sequence (Revision 1, 2, 3, etc.). The Baseline Schedule shall be submitted with no progress percentages applied to activities. The first update shall include the preliminary schedule activities and remaining activities updated as of the second monthly pay request.
- B. Participate in joint review and evaluation of schedules with Architect/Engineer at each submittal.
- C. Evaluate Project status to determine Work behind schedule and Work ahead of schedule.
- D. After review, revise schedules incorporating results of review and resubmit within 10 days.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PRELIMINARY CONSTRUCTION SCHEDULE

- A. Scope of Preliminary Construction Schedule: The Preliminary Progress Schedule shall detail, at a minimum, all work which will be accomplished in the first 60 calendar days following the Notice to Proceed. The general approach of the balance of the work shall be indicated.
- B. Limitation on Construction:
 1. Mobilization and submittals can be in process during the review period.
 2. No construction work shall be permitted until the Preliminary Construction Schedule is submitted and reviewed.
- C. Initial Progress Payment: The first pay request will be based on the update of the preliminary schedule. This submittal shall be in the form of three (3) copies of a computer plotted timescaled logic diagram, the accompanying Microsoft Project CD, and hard copy computer reports sorted by activity number, early start and total float.

3.2 COMPLETE CONSTRUCTION SCHEDULE

- A. Progress Payments:
 1. Shall be withheld in the absence of a reviewed Construction Schedule.

2. No adjustment or extension of time shall be granted for failure to meet the activity dates as shown. Failure to comply with these requirements shall be cause for rejection of any progress payments presented thereafter, until such time as these requirements are met.

3.3 DISTRIBUTION

- A. Copies of reviewed preliminary Construction Schedule and every reviewed revision thereof shall be submitted to the project web site for review by the: Architect, Owner and everyone whose time performance is essential to achieving the progress shown on the schedule. Notification of these updates shall be emailed to all participants with directions to access web site.

3.4 SHORT INTERVAL SCHEDULE

- A. Prepare a 3-week Short Interval ("look-ahead") Schedule for each progress meeting. Show one (1) prior week of actual progress (planned vs actual performance). Forecast two (2) weeks of start and completion dates for each activity, task or event in comparison to the prepared schedule.
 1. Activities in the Short Interval Schedule shall relate directly to activities in the Construction Schedule. Each activity shall be coded with the same ID number, specification number, or other reference the contractor uses on the Construction Schedule. The Short Interval Schedule will have more detail, but each of the details must be related to the Construction Schedule coding.
 2. Indicate start, on-going, intermittent and completion for each activity, task, or event.
 3. The schedule shall show critical path work, as defined by the Construction Schedule that has been affected by any changed conditions authorized through a change order or field order.
- B. Distribute paper copies of the Short Interval Schedule to all attendees at each Progress Meeting.

3.5 UPDATES

- A. General:
 1. The scheduler shall attend all meetings concerning project progress, alleged delays, or time impact.
 2. The schedule shall be modified to reflect the original Contract completion date, subject to review by the Owner. Prior to submittal of the schedule update, the Contractor shall submit an advanced worksheet indicating the intended report status. The Owner, Architect and Contractor shall then meet and agree upon the completion status of the work in progress, and any major logic changes proposed by the Contractor.
 3. Maintain the Construction Schedule at the project meeting location and update weekly by drawing a line vertically through the corresponding progress of each task on the schedule as of the date of that project meeting. The line shall be in varying colors so that differentiation between weeks is readily apparent.
- B. Progress Meetings:
 1. Update the reviewed Construction Schedule at each Progress Meeting.

2. Indicate "actual" progress in percent complete for each activity.
 3. At each progress meeting discuss the Short Interval Schedule. Any deviation from the planned schedule shall be explained by Contractor, with corrective measures, if necessary, to bring progress of Work back in line with the Contract Completion date.
- C. Monthly Update:
1. Contractor shall submit an updated schedule at progress meeting following either one of the following two occurrences:
 - a. Upon completion of a major milestone; or,
 - b. When the actual work completed is more than two (2) weeks behind schedule. Should the schedule show the project completion to be more than two weeks behind, the Contractor shall submit a written explanation and recovery schedule outlining corrective action taken or proposed to bring events back on schedule within a 30 day period.
 2. Show changes occurring since previous schedule submission, such as:
 - a. Any major changes in scope, including authorized or Change Orders;
 - b. Contractor reorganization of his work sequence unrelated to changes in scope;
 - c. Activities modified since previous submission;
 - d. Revised projections for progress and completion, as applicable; and
 - e. Any other identifiable changes.
 3. Provide narrative report as needed to define:
 - a. Problem areas, anticipated delay, and impact of these on schedule; and
 - b. Corrective action recommended and its effect.
- D. Subcontractor Participation:
1. Involve all major subcontractors in preparation of the Periodic Updates of the Construction Schedule.
 2. Obtain approval of the schedule from each major subcontractor and submit in writing together with the Periodic Updates of the Construction Schedule.
- E. Change Orders:
1. Authorized changes to the work shall be included in the schedule network as they occur in the same format and level of detail as contained in the current updated schedule. Enough activities shall be included to adequately describe the work. Code the activities in such a way that they can be identified to the specific Change Order. Insert the Change Order Activities in the network with appropriate logic ties to original network activities.

2. Utilize the time impact analysis submitted with the change order to demonstrate the effect of delays on the overall project schedule.

3.6 TIME EXTENSIONS

- A. The Contractor shall notify the Owner and Architect in writing within forty-eight (48) hours of any event which could delay performance or supplying of any item of the work affecting the critical path. Contractor shall indicate the expected duration of the delay, the anticipated effect of the delay on the Contractor's Construction Schedule, and the action being taken to correct the delay situation. Refer to Metro Agreement.
- B. Extensions of time to the Contractor's Contract may be granted only for delays to activities on the critical path that actually delay the Project Completion beyond the date of Substantial Completion, or for delays to activities that transform that activity onto the critical path, and as a result cause a final completion date beyond the contracted final completion date.
- C. Following receipt of an executed Change Order extending the Contract Time, the activity data and logic relationships shall be incorporated into the current detailed CPM schedule during the next scheduled progress update, as outlined above in Paragraph E "Change Orders" above. In the event the Contractor is entitled to a change in the Contract Time, the adjustment to the contract Time shall be as defined in the General Conditions.

3.7 ABNORMAL INCLEMENT WEATHER

- A. Abnormal Inclement Weather or Unusually Severe Weather: Weather which hinders or prevents work is not a basis for a time extension unless it surpasses in severity the weather reasonably to be expected in the locality at the particular time of year. If a timely notice is filed that a delay was caused by weather sufficiently severe as to entitle additional time, the Contractor is to furnish as promptly as possible thereafter a statement of the portions of the work affected, an explanation as to the reasons work was prevented or hindered by the weather if not readily apparent, the dates on which such portions of work were affected, the total number of days by which the job in its entirety was delayed and any other information which would be of assistance to support the time extension claim such as official weather bureau climatological from the Portland Weather service Office data for several prior years.
- B. Except for site work which may critically affect the Contract Time, no extension of time will be made for abnormal inclement weather after the principle portions of the Work are sufficiently closed-in (exterior walls up and roof in place) so as to permit any structure, or major portion thereof which is part of the Work, to be adequately heated so as to allow the various trades to perform their work.
- C. If the total calendar days lost due to abnormal inclement weather, from the start of the Work at the Project site by the Contractor until the principle portions of the Work are enclosed, exceeds the total number of days to be expected for the same period, a time extension, if granted, shall only be the number of calendar days needed to equal the excess number of calendar days lost due to such abnormal inclement weather.

END OF SECTION 013216

This page intentionally left blank

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including the following
 - 1. Submittal procedures.
 - 2. Construction progress schedules.
 - 3. Proposed product list.
 - 4. Product data.
 - 5. Use of electronic CAD files of Project Drawings.
 - 6. Shop Drawings.
 - 7. Samples.
 - 8. Other submittals.
 - 9. Test reports.
 - 10. Certificates.
 - 11. Manufacturer's instructions.
 - 12. Manufacturer's field reports.
 - 13. Construction photographs.
 - 14. Special job-site submittals
- B. Contractor review.
- C. Architect/Engineer review.
- D. Consent for release of electronic media.

1.2 SUBMITTAL PROCEDURES

- A. Before submittal of shop drawings, brochures, and lists, Contractor shall carefully review same for proper identification, completeness, correctness, dimensions, and technical applicability to the Contract Document requirements and note all corrections, items needing clarification, additional comments, and the like. Upon thorough review and subsequent acceptance by the Contractor, if so accepted, Contractor is to note its approval together with said notes or amendments thereto for compliance with the Contract Documents by suitable stamp, date and the signature of the Contractor or its authorized representative. Submittals will be returned to the Contractor without action by the Architect if the items submitted are not stamped, signed, and identified as approved or approved as noted or other similar language indicating approval by the Contractor, or if the submittal is obviously not thoroughly reviewed.
- B. Submission of shop drawings and samples shall be accompanied by a transmittal letter containing Project name, Contractor's name, number of drawings and samples, titles and other pertinent data.
- C. Many products are specified by one or more named products/manufacturers. In those circumstances where Contractor submits an unnamed, non-prior approved product/manufacturer during this 'shop drawing' phase, said submittal shall be submitted in conformance with Section 012500 - Substitution Procedures.
- D. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - a. The Contractor shall provide submittals requiring coordination with other submittals to the Architect at one time. The Architect will review submittals as received, provide comments, and return them to the Contractor. If the Contractor did not submit all submittals requiring coordination at the same time, and a later submittal identifies conflicts, the Contractor will be responsible for all costs associated with changes necessary to properly coordinate the installation of the materials.
 - 3. To avoid the need to delay installation as a result of the time required to process submittals, the Contractor shall anticipate the review times noted in this section and anticipate the possibility of a resubmittal or rejected submittal and the effect that action would have on the Project schedule.

- a. All required submittals shall be initially received by the Architect within 60 days following the Notice to Proceed date, or sooner as required by the following submittal review times, to meet the Construction Schedule need for materials related to the submittals. Submittals received after these time periods shall not be a cause for delay claims to the Project. Architect will not accelerate review time for submittals received after the indicated time periods, regardless of any potential impact to the Contractor's schedule.
 - b. Submittals requiring color selection and material selection are interdependent on receiving all submittals at the same time that have such selection requirements. Allow 20 working days from the date of receipt of the last such submittal by the Contractor for the Architect to complete color selections and mail out from the Architect's office.
 - c. Allow additional 5 working days for submittals requiring Architect consultant review.
 - d. For all other submittals allow 10 working days, after receipt by the Architect, to complete the initial review and mail out from the Architect's office.
 - e. If the Architect must delay processing a submittal to permit coordination with subsequent submittals, the 10 working days will begin upon receipt of the last such coordination submittal from the Contractor.
 - f. If several submittals are provided by the Contractor at the same time, allow 20 working days after receipt by the Architect to complete the initial review and respond. Provide an "Order of Priority List" to the Architect with the submittal.
 - g. If an intermediate submittal is necessary, process the same as the initial submittal.
 - h. Allow 10 working days for reprocessing each submittal after receipt unless noted otherwise.
- E. Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block. Consecutively number each submittal beginning with the number 001.
- 1. Provide adequate space for the Contractor's stamp and approval, plus a space approximately 4 by 5 inches each on the label or beside the title block on Shop Drawings to record the Architect's review and approval markings and the action taken.
 - 2. Include the following information on the label or title block for processing and recording action taken.
 - a. Project name and job number.
 - b. Date.
 - c. Name and address of the Architect.
 - d. Name and address of the Contractor, subcontractor, supplier and manufacturer as appropriate.

- e. Number and title of appropriate Specification Section.
 - f. Drawing number and detail references, as appropriate.
- F. Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Architect using a transmittal form. Submittals received from sources other than the Contractor will be returned through the Contractor without action. Submittals not requested will be returned unprocessed.
- 1. Address no more than one topic or related topics on a single transmittal (i.e. mechanical items shall not be submitted under same transmittal with electrical items, even though the same Contractor/subcontractor may be responsible for both).
 - 2. Record relevant information, deviations, and requests for data, including minor variations and limitations from the Contract Documents.
 - 3. Shop drawings, product data, samples, and mock-up as required for submissions by the technical specification sections are to be submitted for Architect's review/approval until "No Exception Taken" or "Make Corrections Noted" is obtained. The number of submittals required is noted in parenthesis.
 - a. Shop Drawings: (2) sets; plus one (1) additional set for Structural, Mechanical and Electrical submittals. Or one PDF if transmitted electronically (PDF method preferred).
 - b. Product Data: (2) copies; plus one (1) additional copy for Structural, Mechanical and Electrical submittals. Or one PDF if transmitted electronically (PDF method preferred).
 - c. Samples: (3) each.
 - d. Mock-ups: As required by any technical specification section.
 - e. Reference applicable mechanical and electrical technical specifications' sections for additional submittal requirements.
 - 4. Material and Color Submittal: Submit samples of actual colors of materials.
 - 5. Number submittals as follows: Numerical Order, Spec Section and Revision.
 - 6. In the event of the need to "Revise and Resubmit" a submittal, resubmit same in acceptable form/content, clearly identifying deviations from previous submittal content.
- G. Do not transmit submittals directly to Architect's consultants. Architect will review and transmit submittals to consultants for their review.
- H. Prior to submitting transmittals required by Building Code to building code officials and other Authorities Having Jurisdiction (AHJ), transmit submittals to Architect for review and approval.
- I. Maintain copy in project Field Office of each submittal, regardless of status, along with a current Submittal Log,

1.3 CONSTRUCTION PROGRESS SCHEDULE SUBMITTALS

- A. Comply with Section 013216 - Construction Progress Schedule

1.4 PROPOSED PRODUCT LIST

- A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name and model number of each product.
- B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation and reference standards.

1.5 PRODUCT DATA

- A. Product Data: Submit to Architect/Engineer for review for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Submit electronic submittals via email as PDF electronic files.
- C. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- D. Indicate product utility and electrical characteristics, utility connection requirements and location of utility outlets for service for functional equipment and appliances.
- E. After review, distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.6 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

- A. Electronic CAD Files of Project Drawings: May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.
- B. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:
 - 1. Use of files is solely at receiver's risk. Architect/Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy or conflict between information on electronic media and that in Contract Documents, notify Architect/Engineer of discrepancy and use information in hard-copy Drawings and Specifications.
 - 2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
 - 3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.

4. Receiver shall not hold Architect/Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation or use of this electronic information.
5. Receiver shall understand that even though Architect/Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
6. Receiver shall not hold Architect/Engineer responsible for such viruses or their consequences and shall hold Architect/Engineer harmless against costs, losses or damage caused by presence of computer virus in files or media.
7. The Contractor is to obtain a Consent for Release of Electronic Media per attached form (an electronic version of this form is available upon request). Subcontractors are to obtain this information from the Contractor and their use of the electronic files is subject to the same conditions.

1.7 SHOP DRAWINGS

- A. Shop Drawings: Submit to Architect/Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Submit drawings drawn to accurate scale. Shop drawings are not intended to change the design. Do not reproduce Contract documents or copy standard information for use as Shop Drawings. Standard information prepared without specific references to the project is not a Shop Drawing.
- C. Provide fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings. Include the following information:
 1. Dimensions.
 2. Identification of products and materials included.
 3. Compliance with specified standards.
 4. Notation of coordination requirements.
 5. Notation of dimensions established by field measurements.
 6. Any deviation from contract drawings or specifications.
 7. Date when review has to be finalized to meet schedule.
- D. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- E. When required by individual Specification Sections, provide Shop Drawings signed and sealed by a professional Engineer responsible for designing components shown on Shop Drawings.
 1. Include signed and sealed calculations to support design.

2. Submit Shop Drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
 3. Make revisions and provide additional information when required by authorities having jurisdiction.
- F. All items shown on shop drawings that do not conform to plans and specifications shall be specifically noted as such (flagged) and brought to the Architect's attention. In any case, the Architect's stamp of review shall not include approval of unauthorized changes in the Contract Documents, except where specific written approval is given.
- G. Contractor is responsible for obtaining and distributing required shop drawings to its subcontractors and material suppliers after, as well as before, final review by the Architect. Prints or PDF's of reviewed shop drawings shall be made from approved submittals which carry the Contractor's and Architect's appropriate stamps. Architect/Owner and applicable consultants and AHJ shall retain copies of each shop drawing submittal.
- H. Submit electronic submittals via email as PDF electronic files.

1.8 SAMPLES

- A. Samples: Submit to Architect/Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Samples for Selection as Specified in Product Sections:
1. Submit to Architect/Engineer for aesthetic, color and finish selection.
 2. Submit Samples of finishes, textures and patterns for Architect/Engineer selection.
- C. Submit Samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate Sample submittals for interfacing work.
1. Where variation in color, pattern, texture or other characteristics are inherent in the material, submit not less than four (4) units to show approximate limits of the variations.
- D. Include identification on each Sample, with full Project information.
- E. Submit number of samples specified in individual Specification Sections; Architect/Engineer may retain one sample.
- F. Reviewed Samples, which may be used in the Work, are indicated in individual Specification Sections.
- G. Samples will not be used for testing purposes unless specifically stated in Specification Section.
- H. Unless noted otherwise in the relevant technical section of these specifications, remove all samples and mock-ups from the project site, after review and approval by the Owner and Architect.

1.9 OTHER SUBMITTALS

- A. Closeout Submittals: Comply with Section 017000 - Execution and Closeout Requirements.

- B. LEED Submittals: Comply with Section 018113 - Sustainable Design Requirements. Permits: Within 15 days after date established in Notice to Proceed, submit a list of permits and licenses to be obtained, identifying the granting agency and the required date of permit submittal. DESIGN DATA

1.10 TEST REPORTS

- A. Informational Submittal: Submit reports for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit test reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.11 CERTIFICATES

- A. Informational Submittal: Submit certification by manufacturer, installation/application Subcontractor, or Contractor to Architect/Engineer, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product but must be acceptable to Architect/Engineer.

1.12 MANUFACTURER'S INSTRUCTIONS

- A. Informational Submittal: Submit manufacturer's installation instructions for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, to Architect/Engineer in quantities specified for Product Data.
- C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.13 MANUFACTURER'S FIELD REPORTS

- A. Informational Submittal: Submit reports for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit a PDF report within 5 days of observation to Architect/Engineer for information unless it is needed sooner.
- C. Submit reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.14 CONSTRUCTION PHOTOGRAPHS

- A. Provide photographs of Site and construction throughout progress of Work produced by an experienced photographer acceptable to Architect/Engineer.
- B. Submit photographs with Application for Payment.

- C. Take sufficient Site photographs from different directions and sufficient interior photographs indicating relative progress of the Work, 5 days maximum before submitting pay request, to confirm progress.
- D. Identify digital prints with file name. Identify name of Project, contract number, orientation of view, date and time of view and photographer's numbered identification of exposure.
- E. Digital Images: Deliver complete set of digital image electronic files on CD-ROM or other approved media to Architect with project record documents. Identify electronic media with date photographs were taken (not necessary on digital prints). Submit images that have same aspect ratio as sensor, uncropped.
 - 1. Digital Images: Uncompressed JPG or other approved format, produced by a digital camera with minimum sensor size of 4.0 megapixels, and image resolution of not less than 1024 by 768 pixels.

1.15 SPECIAL JOB-SITE SUBMITTALS

- A. Hazardous Chemical Inventory:
 - 1. In order to comply with the State of Oregon's Hazard Communication Rules (HCS, general industry - Division 2/Z, 1910.1200), the Owner requires the Contractor to provide a complete inventory of all potentially hazardous chemicals which the Contractor (including subcontractors) will bring into or produce at the work site. This inventory shall be submitted to the Architect no later than three days prior to the chemicals arrival on site. Specific information for each chemical, in the form of Material Safety Data Sheets (MSDS), and the personal protective equipment required for working with the materials (respirators, special clothing, etc.) shall be included in the submittal.
 - 2. The Contractor shall revise this information as necessary (i.e. when new chemicals are brought onto or produced at the worksite), with updates forwarded to the Architect. A complete and accurate copy of this information shall be immediately available at the Contractor's worksite office for reference by Owner representatives and the Contractor's employees during the Contractor's working hours.
- B. Submit revised inventory monthly or whenever changes are made.

1.16 CONTRACTOR REVIEW

- A. Review for compliance with Contract Documents and approve submittals before transmitting to Architect/Engineer.
- B. Contractor: Responsible for:
 - 1. Determination and verification of materials including manufacturer's catalog numbers.
 - 2. Determination and verification of field measurements and field construction criteria.
 - 3. Checking and coordinating information in submittal with requirements of Work and of Contract Documents.

4. Determination of accuracy and completeness of dimensions and quantities.
 5. Confirmation and coordination of dimensions and field conditions at Site.
 6. Construction means, techniques, sequences and procedures.
 7. Safety precautions.
 8. Coordination and performance of Work of all trades.
- C. Stamp, sign or initial and date each submittal to certify compliance with requirements of Contract Documents.
- D. Do not fabricate products or begin Work for which submittals are required until approved submittals have been received from Architect/Engineer.

1.17 ARCHITECT/ENGINEER REVIEW

- A. Do not make "mass submittals" to Architect/Engineer. "Mass submittals" are defined as six or more submittals or items in one day or 20 or more submittals or items in one week. If "mass submittals" are received, Architect/Engineer's review time stated above will be extended as necessary to perform proper review. Architect/Engineer will review "mass submittals" based on priority determined by Architect/Engineer after consultation with Owner and Contractor.
- B. Informational submittals and other similar data are for Architect/Engineer's information, do not require Architect/Engineer's responsive action and will not be reviewed or returned with comment.
- C. Submittals made by Contractor, which are not required by Contract Documents, may be returned without action.
- D. Architect review of submittals does not relieve the Contractor from his responsibilities for conformance with the Contract Documents, proper installation, compliance with applicable codes, or coordination of the Work.
- E. Submittal approval does not authorize changes to Contract requirements unless accompanied by: Change Order, Architect's Supplemental Instruction, Field Order, Substitution Request or Construction Change Directive.
- F. Owner may withhold monies due to Contractor to cover additional costs beyond the second submittal review.
- G. The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be marked to indicate the action to be taken.
- H. The Architect will distribute the reviewed submittals to:
1. Architect project file and/or Owner.
 2. AHJ (as required)
 3. Architect sub-consultants.

4. Contractor.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 013300

This page intentionally left blank



**CONSENT FOR THE RELEASE
OF ELECTRONIC MEDIA**

Project:	Oregon Metro OCC Door Access Control	Recipient:	
Architect's Project No.:	22349.00	Date:	

The Recipient and the Architect hereby approve the release of electronic media as follows:

1. The Recipient agrees, to the fullest extent permitted by law, to indemnify and hold the Architect and its Consultants harmless from any damage, liability, or cost, including reasonable attorney's fees and cost of defense arising from any reuse or modifications of the electronic media by the Recipient or any person or entity which acquires or obtains the electronic media from or through the Recipient. In no event shall the Architect or its Consultants be liable for any loss of profit or any damages.
2. The Architect and Consultants make no warranties, either express or implied, of merchantability and fitness for any particular purpose.
3. Files are recognized to be subject to alteration, degradation, erosion and erasure. The Recipient is advised to check all electronic media for computer viruses before loading the files. The Recipient agrees to indemnify and hold harmless the Architect and its Consultants from and against all claims of any kind put forth by the Recipient or others as a result of inadvertent viruses transmitted with the electronic files.
4. The electronic files are provided as a convenience to the Recipient and are not considered the Contractual Instruments of Service nor considered "Contract Documents" or "Drawings of Record" or "Construction Documents" or "As-Built Drawings."
5. The Architect and Consultants shall be deemed the authors of the transferred media, and will retain all common law, statutory and other reserved rights, in addition to the copyright. Each party shall have the right to alter, modify or delete materials without consequence to the other party, as long as the changes are not attributed to the other party.
6. The information is for use on this project only and not to be used for other purposes.
7. Recipient agrees to compensate Architect and Consultant reasonable costs for preparation of the electronic files as agreed upon.

Approved by Owner:			
Name:		By:	
Date:		Title:	
Approved by Architect:		Accepted by Recipient:	
Name:	Integrus Architecture, P.S.	Name:	
By:		By:	
Title:		Title:	
Date:		Date:	

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Construction Indoor Air Quality (IAQ) Management Plan.
2. HVAC air filters.

B. Intent:

1. Prevent indoor air quality problems resulting from construction process.
2. Protect HVAC system during construction, control pollutant sources, and interrupt contamination pathways.

PART 2 PRODUCTS

2.1 HVAC AIR FILTERS

A. Return Filters: Filtration media rated for minimum efficiency reporting value (MERV) when tested according to ASHRAE 52.2.

1. Construction Return Filters: MERV of 8.

PART 3 EXECUTION

3.1 CONSTRUCTION PROCEDURES - GENERAL

A. Prevent the absorption of moisture and humidity by absorptive materials by:

1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
3. Provide sufficient ventilation for drying within reasonable time frame.

B. Begin construction ventilation when building is substantially enclosed.

C. If extremely dusty or dirty work must be conducted inside the building, shut down HVAC systems for the duration; remove dust and dirt completely before restarting systems.

D. When working in a portion of an occupied building, prevent movement of air from construction area to occupied area or into building HVAC system.

E. All tools and equipment used within a building return air space shall be equipped with a filter system to reduce the introduction of particulate and odor into the return air.

- F. Fabricated products shall be pre-finished off-site wherever practical and to the greatest extent possible. The use of spray equipment for applying finishes in buildings shall be used only upon approval of Owner.
- G. Do not store construction materials or waste in mechanical or electrical rooms.
- H. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.
- I. During installation of carpet, resilient flooring, paints, furnishings, and other VOC emitting products, provide supplemental (spot) ventilation for at least 72 hours after work is completed and describe these activities in the weekly reports.
- J. Operate HVAC with supply air system only and use exhaust fans to remove air outside of ducted system to avoid contaminating return air ducts.
- K. Conduct regular inspection and maintenance of indoor air quality measures, including ventilation system protection and ventilation rate.
- L. Require VOC safe masks for workers installing VOC emitting products (interior and exterior) defined as products that emit 150 g/L or more.
- M. Use low-toxic cleaning supplies for surfaces, equipment, and worker's personal use.
- N. When dry sanding for gypsum board assemblies, provide the following protection:
 - 1. Isolate the space.
 - 2. Provide plastic sheet separation during sanding.
 - 3. Close and seal all air system devices and ductwork.
 - 4. Sequence construction to avoid contamination of other spaces with gypsum dust.
 - 5. Provide worker protection.

3.2 FILTER INSTALLATION AND REPLACEMENT

- A. Replace filters after completing construction
 - 1. Replace supply filters.

3.3 IAQ MANAGEMENT PLAN IMPLEMENTATION

- A. The Contractor is required to implement and maintain approved IAQ Management Plan for the duration of the Project, and to update procedures at any time due to unanticipated building conditions.
- B. Provide reports and photographs of construction IAQ management measures such as protection of ducts and on-site stored or installed absorptive materials. In each report describe and illustrate IAQ measures (installation, effectiveness, upkeep, etc.) during construction along with a description of the SMACNA approach employed.

1. Provide data sheets of filtration media used during construction and installed immediately prior to building flush out and prior to building occupancy.

3.4 REMOVAL

- A. Remove all IAQ measures as well as signs, framing, and supports at completion of project. If an IAQ measure may, in the Contractor's opinion, remain confirm this in advance with the Owner's Representative before leaving it in place.
- B. Submit a report upon completion stating that all procedures stated in the approved IAQ Management Plan have been complied with. This report shall contain all reports and photographs, as well as any IAQ management plan activities which occurred during the project. Submit electronic report.

END OF SECTION 013536

This page intentionally left blank

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality Control Plan.
- B. Quality control.
- C. Tolerances.
- D. References.
- E. Labeling.
- F. Mockup requirements.
- G. Testing and inspection services.
- H. Manufacturers' field services.

1.2 QUALITY CONTROL PLAN

- A. Prepare and submit a Quality Control Plan to the Project Manager within thirty (30) days following the Notice to Proceed. Describe the Contractor's procedures for implementing the Quality Control Plan. Include without limitation the Quality Control organization, inspection procedures, tests anticipated, materials control, contingency plans related to fire protection and remediation of contaminated releases or other environmental improvement, and reports. Owner reserves the right to accept, reject, or modify the Quality Control Plan. Contractor will submit an interim Quality Control Plan prior to the start of Work to cover the first thirty (30) days of construction.

1.3 QUALITY CONTROL

- A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.
- B. Quality Control Manager: Prior to initiation of construction, Contractor shall designate in writing a Quality Control Manager who shall be responsible for coordinating Contractor's Quality Control Program. The individual so designated shall be the interface with the Project Manager on matters relating to submittals, inspection, scheduling, unacceptable Work product, and corrective actions. Metro reserves the right to accept or reject the Quality Control Manager designated by Contractor.
- C. Comply with specified standards as the minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- D. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
- E. Perform Work using persons qualified to produce required and specified quality.
- F. Products, materials, and equipment may be subject to inspection by Architect/Engineer and Owner at place of manufacture or fabrication. Such inspections shall not relieve Contractor of complying with requirements of Contract Documents.
- G. Supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.
- H. Maintain project superintendent continually on Project site for duration of Work of this Contract. Do not engage project superintendent in work other than Work of this Contract.
- I. Comply fully with manufacturers' instructions, including each step in sequence.
 1. Should manufacturers' instructions conflict with Contract Documents; request clarification from Architect before proceeding.
- J. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within thirty (30) days of date established for the Notice to Proceed.
 1. Distribution: Distribute schedule to Owner, Architect testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.4 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.
- D. Allow tolerances for thermal expansion and effects of mechanical vibration.

1.5 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current as of date of Contract Documents except where specific date is established by code.

- C. Obtain copies of standards and maintain on Site when required by product Specification Sections.
- D. When requirements of indicated reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- E. Neither contractual relationships, duties, or responsibilities of parties in Contract nor those of Architect/Engineer shall be altered from Contract Documents by mention or inference in reference documents.
- F. Abbreviations and Names: Abbreviations and acronyms are frequently used in the Specifications and other Contract Documents to represent the name of a trade association, standards developing organization, authorities having jurisdiction, or other entity in the context of referencing a standard or publication. Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they mean the recognized name of the entities. Refer to Gale Research's "Encyclopedia of Associations" or Columbia Books' "National Trade and Professional Associations of the U.S.," which are available in most libraries or a search engine dedicated to construction industry data such as <http://www.4specs.com> or <http://www.arcat.com>.

1.6 LABELING

- A. Attach label from agency approved by authorities having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.
- B. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label:
 - 1. Model number.
 - 2. Serial number.
 - 3. Performance characteristics.
- C. Manufacturer's Nameplates, Trademarks, Logos, and Other Identifying Marks on Products: Not allowed on surfaces exposed to view in public areas, interior or exterior.

1.7 MOCK-UP REQUIREMENTS

- A. Tests will be performed under provisions identified in this Section and identified in individual product Specification Sections.
- B. Assemble and erect specified or indicated items with specified or indicated attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mockups shall be comparison standard for remaining Work.
- D. Where mockup has been accepted by Architect/Engineer and is specified in product Specification Sections to be removed, remove mockup and clear area when directed to do so by Architect/Engineer.

1.8 TESTING AND INSPECTION SERVICES

- A. Owner will employ and pay for specified services of an independent firm to perform testing and inspection.
- B. Independent firm will perform tests, inspections, and other services specified in individual Specification Sections and as required by Architect/Engineer, Owner or authorities having jurisdiction.
 - 1. Laboratory: Authorized to operate at Project location.
 - 2. Laboratory Staff: Maintain full-time specialist on staff to review services.
 - 3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.
- C. Testing, inspections, and source quality control may occur on or off Project Site. Perform off-Site testing as required by Architect/Engineer or Owner.
- D. Reports shall be submitted by independent firm to Architect/Engineer, Contractor and authorities having jurisdiction, in PDF format indicating observations and results of tests and compliance or noncompliance with Contract Documents.
 - 1. Submit final report indicating correction of Work previously reported as noncompliant.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
 - 1. Notify Architect/Engineer and independent firm 24 hours before expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional Samples and tests required for Contractor's use.
- F. Employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work according to requirements of Contract Documents.
- G. The Contractor shall arrange and pay for all inspection and testing required by the Contract Documents except for tests specifically indicated herein as the responsibility of the Owner. The Contractor shall also be responsible for all costs of all inspections and testing including, but not limited to, the following:
 - 1. Re-inspection and/or retesting of Owner provided inspections or testing due to failure.
 - a. Retesting or re-inspection required because of nonconformance with specified or indicated requirements shall be performed by same independent firm on instructions from Architect/Engineer. Payment for retesting or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.
 - 2. Testing required because of changes in materials or proportions at the request of the Contractor.

3. Contractor's duties for owner provided inspections and tests, as specified.
- H. Agency Responsibilities:
1. Test Samples of mixes submitted by Contractor.
 2. Provide qualified personnel at Site. Cooperate with Architect/Engineer and Contractor in performance of services.
 3. Perform indicated sampling and testing of products according to specified standards.
 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 5. Promptly notify Architect/Engineer and Contractor of observed irregularities or nonconformance of Work or products.
 6. Perform additional tests required by Architect/Engineer.
 7. Attend preconstruction meetings and progress meetings.
- I. Agency Reports: After each test, promptly submit PDF copies of report to Architect/Engineer, Contractor, and authorities having jurisdiction. When requested by Architect/Engineer, provide interpretation of test results. Include the following:
1. Date issued.
 2. Project title and number.
 3. Name of inspector.
 4. Date and time of sampling or inspection.
 5. Identification of product and Specification Section.
 6. Location in Project.
 7. Type of inspection or test.
 8. Date of test.
 9. Results of tests.
 10. Conformance with Contract Documents.
- J. Limits on Testing Authority:
1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency or laboratory may not approve or accept any portion of the Work.
 3. Agency or laboratory may not assume duties of Contractor.

4. Agency or laboratory has no authority to stop the Work.

1.9 MANUFACTURER'S FIELD SERVICES

- A. When specified in individual Specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe Site conditions, conditions of surfaces and installation, quality of workmanship, startup of equipment, testing, adjusting, and balancing of equipment and commissioning as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect/Engineer 30 days in advance of required observations. Observer is subject to approval of Architect/Engineer.
- C. Report observations and Site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.
- D. Refer to Section 013300 - Submittal Procedures, "Manufacturer's Field Reports" Article.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Prepare a record of tests and inspections. Include the following:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project Site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 ACCEPTABLE TESTING AGENCIES

- A. Testing Agency used to be approved by Owner and Architect.

3.3 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 1. Comply with the Contract Document requirements. See Section 017000 – Execution and Closeout Requirements.
- B. Protect construction exposed by or for quality-control service activities.

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

END OF SECTION 014000

This page intentionally left blank

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes
 - 1. Temporary Utilities
 - 2. Construction Facilities
 - 3. Temporary Controls

1.2 PROTECTION OF EXISTING UTILITIES

- A. Concealed utilities of record are shown on Drawings. These are not necessarily exact with respect to location or completeness.
- B. Notify Owner in writing, on each occasion, of intent to work near or on existing underground utility services or structures that may affect Owner occupied portions of Project Site. Submit procedure for safe and continuous operation of services. Do not proceed prior to approval.
- C. Proceed with sufficient caution to preclude damaging utilities known or unknown. In event unidentified utilities are encountered, promptly notify Owner.
- D. In the event Owner's utilities are damaged during construction, promptly provide temporary services and make repairs to maintain continuity of services at the Contractor's expense.

1.3 TEMPORARY ELECTRICITY

- A. Owner will pay cost of energy used. Exercise measures to conserve energy. Use Owner's existing power service.
- B. Complement existing power service capacity and characteristics as required for construction operations.
- C. Permanent convenience receptacles may be used during construction. Replace any damaged receptacles caused by this use.

1.4 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Maintain lighting and provide routine repairs.
- B. Permanent building lighting may be used during construction with Owner approval. Re-lamp all fixtures used for temporary lighting at substantial completion and provide documentation.

1.5 TEMPORARY HEATING

- A. Existing heating systems may be used during construction with Owner approval.
- B. Replace filters at Substantial Completion.

- C. Where construction is in progress, provide a dust free atmosphere and heating for curing, reducing moisture and humidity and suitable temperatures for installation of specified products unless indicated otherwise in specifications. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress unless indicated otherwise in individual product Sections.
- D. Portable Heaters: Electric, non-combustion, forced air fan units complete with controls, acceptable to Owner and Architect. Use of heaters that generate moisture or hazardous fumes are prohibited.

1.6 TEMPORARY COOLING

- A. Existing cooling systems shall not be used during construction.
- B. Provide and pay for cooling devices and cooling as needed to maintain specified conditions for construction operations. Provide separate metering and reimburse Owner for cost of energy used.

1.7 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity and to prevent accumulation of dust, fumes, vapors or gases.
- B. When hazardous chemicals, mineral-spirit based paints, adhesives, or other similar materials are used, the Contractor shall exhaust toxic, noxious, or odor producing fumes from the building. Method of exhaust shall ensure safety of building occupants and pedestrians in and around the project site. All existing building supply and return air ductwork within the construction area shall be capped air-tight to prevent distribution of fumes throughout the building.
- C. Replace filters, clean and lubricate system prior to acceptance by Owner.

1.8 COMMUNICATION SERVICES

- A. Provide, maintain and pay for telephone service to field office at time of project mobilization. At each telephone, post a list of important telephone numbers.
 - 1. Police and fire departments.
 - 2. Ambulance service.
 - 3. Contractor's home office.
 - 4. Architect's office.
 - 5. Owner's Office.
 - 6. Principal subcontractors' field and home offices.
 - 7. All site phone lines.
- B. Provide mobile telephone or digital pager for superintendent's use, to be operational and kept on his/her person at all times during working hours under this contract.

- C. Internet Service: Provide, maintain, and pay for broadband Internet service to field office at time of Project mobilization. Provide desktop computer with Microsoft operating system and appropriate office function software, modem and printer.

1.9 TEMPORARY WATER SERVICE

- A. Owner will pay cost of temporary water. Exercise measures to conserve energy. Use Owner's water system, extended and supplemented with temporary devices (provided at Contractor's expense) as needed to maintain specified conditions for construction operations.
- B. Drinking Water: General Contractor to furnish from a proven safe source for all those connected with the work. Pipe or transport in such manner as to keep it clean and fresh. Serve in single service containers or by sanitary drinking fountains.

1.10 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Existing facility use is not permitted. Provide facilities at time of Project mobilization.

1.11 FIELD OFFICES AND SHEDS

- A. Provide Field Office: Weathertight, with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture including: conference table, drawing rack, filing cabinets and drawing display table.
- B. Provide space for Project meetings, with table and chairs to accommodate six persons.
- C. Locate field offices and sheds a minimum distance of 30 feet from existing and new structures.
- D. Storage Areas and Sheds: Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and inspection of products to suit requirements in Section 016000 - Product Requirements.
- E. Installation:
 - 1. Install field office spaces ready for occupancy 15 days after date established by Notice to Proceed.
 - 2. Employee Residential Occupancy: Not allowed on Owner's property.
- F. Maintenance and Cleaning:
 - 1. Weekly janitorial services for field offices; periodic cleaning and maintenance for sheds and storage areas.
 - 2. Maintain walks free of mud, water, snow and the like.
- G. Removal: At completion of Work remove buildings, foundations, utility services and debris. Restore areas to same or better condition as original condition.

1.12 VEHICULAR ACCESS

- A. Provide unimpeded access for emergency vehicles. Maintain 20 foot wide driveways with turning space between and around combustible materials.
- B. Maintain access to fire hydrants and control valves free of obstructions.
- C. Provide means of removing mud from vehicle wheels before entering streets to AHJ standards.
- D. Use designated existing on-Site roads for construction traffic.

1.13 PARKING

- A. If Site space is not adequate, provide additional off-Site parking.
- B. Use of designated areas of existing parking facilities used by construction personnel is permitted. Coordinate with owner.
- C. Do not allow heavy vehicles or construction equipment in parking areas.
- D. Maintenance:
 - 1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, ice and the like.
 - 2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water and other deficiencies, to maintain paving and drainage in original condition.
- E. Removal, Repair:
 - 1. Remove temporary materials and construction at Substantial Completion.
 - 2. Repair facilities damaged by use, to original condition.

1.14 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces, before enclosing spaces.
- C. Broom and vacuum clean interior areas before starting surface finishing and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and rubbish from Site weekly and dispose of off-Site. Comply with Section 017419 - Construction Waste Management and Disposal.
- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

- F. Dispose of flammable, hazardous and toxic waste materials on daily bases. Do not permit storage inside buildings.
- G. Provide vehicles to haul materials off site that are constructed and loaded so as to prevent any leaking of materials from the vehicle (RCW 46.61.655). Keep sidewalks, lawns, parking areas and streets clear of all construction materials, debris, gravel, rock and dirt attributed to the General Contractor or the sub-contractors. Clean up these areas on a daily and/or "upon request" basis as determined by the Architect's representative.

1.15 PROJECT IDENTIFICATION

- A. Project Identification Sign:
 - 1. One painted sign, 32-sq ft area, with bottom at 6 feet aboveground.
 - 2. Content:
 - a. Project title and name of Owner.
 - b. Names and titles of authorities.
 - c. Names and titles of Architect/Engineer and Consultants.
 - d. Name of Prime Contractor and major Subcontractors.
 - 3. Graphic Design, Colors, and Style of Lettering: approved by Architect/Engineer.
- B. Project Informational Signs:
 - 1. Painted informational signs of same colors and lettering as Project identification sign or standard products; size lettering for legibility at 100-foot distance.
 - 2. Provide sign at each field office and storage shed and provide directional signs to direct traffic into and within Site. Relocate as Work progress requires.
 - 3. No other signs are allowed without Owner's permission except those required by law.
- C. Design sign and structure to withstand 60-mph wind velocity.
- D. Sign Painter: Experienced as professional sign painter for minimum of three years.
- E. Finishes, Painting: Adequate to withstand weathering, fading and chipping for duration of construction.
- F. Sign Materials:
 - 1. Structure and Framing: structurally adequate.
 - 2. Sign Surfaces: Exterior grade plywood with medium-density overlay, minimum of 3/4 inches thick, standard large sizes to minimize joints.
 - 3. Paint and Primers: Exterior quality, two coats; sign background of color as selected.

4. Lettering: Precut vinyl self-adhesive products, white.
- G. Installation:
 1. Install Project identification sign within 15 days after date established by Notice to Proceed.
 2. Erect at approved location of high public visibility adjacent to main entrance to Site.
 3. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
 4. Install sign surface plumb and level, with butt joints. Anchor securely.
 5. Paint exposed surfaces of sign, supports and framing.
- H. Maintenance: Maintain clean signs and supports; repair deterioration and damage.
- I. Removal: Remove signs, framing, supports and foundations at completion of Project and restore area.
- J. No other signs are allowed without Owner permission except those required by law.

1.16 TRAFFIC REGULATION

- A. Signs, Signals, and Devices:
 1. Post-Mounted and Wall-Mounted Traffic Control and Informational Signs: As approved by authorities having jurisdiction.
 2. Traffic Control Signals: As approved by local jurisdictions.
 3. Traffic Cones, Drums, Flares, and Lights: As approved by authorities having jurisdiction.
 4. Flag Person Equipment: As required by authorities having jurisdiction.
- B. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.
- C. Traffic Signs and Signals:
 1. Provide signs at approaches to Site and on Site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
 2. Relocate signs and signals as Work progresses, to maintain effective traffic control.
- D. Removal:
 1. Remove equipment and devices when no longer required.
 2. Repair damage caused by installation.

1.17 FIRE-PREVENTION FACILITIES

- A. Prohibit smoking within buildings under construction and demolition. Designate area on Site where smoking is permitted. Provide approved ashtrays in designated smoking areas.
- B. Establish fire watch for cutting, welding, and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.
- C. Standpipes: Install minimum of one standpipe for use during construction before building reaches 40 feet in height.
- D. Portable Fire Extinguishers: NFPA 10; 10-pound capacity, 4A-60B: C UL rating.
 - 1. Provide one fire extinguisher at each stairway on each floor of buildings under construction and demolition.
 - 2. Provide minimum of one fire extinguisher in every construction trailer and storage shed.
 - 3. Provide minimum of one fire extinguisher on roof during roofing operations using heat-producing equipment.

1.18 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by authorities having jurisdiction for public rights-of-way.
- C. Protect non-owned vehicular traffic, stored materials, Site, and structures from damage.

1.19 EXISTING TREE AND PLANT PROTECTION

- A. Critical Root Zone: Generally a circular area surrounding a tree, the center of which is the center of the tree trunk and the radius is the distance from the outside of the trunk to any point 12 times the diameter, as measured at 4½ feet from the ground on the low side of the trunk, which point constitutes the circumference of the critical root zone.
- B. Zone of Protection: The area of the critical root zone shall be fenced with no construction related activities allowed within this zone of protection. The restricted activities are, but are not limited to, storage, paving, grading, cutting, filling, travel within, dumping, or spillage of any solid or liquid unless otherwise shown on the Drawings.
- C. During and Post-Construction Requirements:
 - 1. The protective fence shall not be disturbed or removed until all exterior construction has been completed.
 - 2. Water shall be applied periodically until the completion of exterior construction.

3. No rototilling or major soil disturbance shall take place within this zone of protection, before, during, or after the construction.
 4. Fertilize deciduous trees as directed by the Landscape Architect every six months during the course of construction and for one year after Final Completion.
 5. Prior to Final Completion, prune deciduous trees to remove damaged branches and encourage healthy new growth. Landscape Architect will review complete pruning and direct additional work if it is necessary in his opinion, which work to be done at no additional cost to the Owner.
- D. The Contractor shall protect all trees and other plant types on site from damage until project completion. If any tree or other type of plants are destroyed, disfigured, or damaged so that in Architect's opinion removal is required, Contractor will be assessed damages to include the cost of removal and the cost for replacement of a comparably mature tree or plant including maintenance and a guarantee of replacement if the tree or plant fails to thrive for one full year following Final Completion.
- E. If at any time the Contractor judges that the protection of a tree designated to be saved is incompatible with work required, or if operations necessarily threaten the health of a tree, notify immediately the Architect's representatives and do no further work affecting the tree until a written agreement is reached concerning acceptable procedures.

1.20 TRAFFIC AND PEDESTRIAN OBSTRUCTIONS

- A. Provide signs and/or flagpersons in accordance with ORS Chapter 810 for deliveries or operations which obstruct traffic in the street.
- B. Contractor's equipment located on sidewalks or other pedestrian ways shall be suitably barricaded for cane detection as a warning for sight impaired persons. Barricade shall include a horizontal member at a maximum of two feet above the walking surface. Pedestrian traffic will be diverted with appropriate signs, barricades, fences, etc., from any area where contractor equipment or operations may pose a threat to the safety and health of passing pedestrians.

1.21 ENCLOSURES AND FENCING

- A. Construction: approved Contractor's option.
- B. Provide 6-foot-high fence around construction Site; equip with vehicular gates with locks.
1. Post fence with "Danger Hard Hat Area" signs at maximum 50 foot centers.
- C. Exterior Enclosures:
1. Provide temporary insulated, weathertight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual Specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

D. Interior Enclosures:

1. Provide temporary partitions and ceilings as indicated on Drawings to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.

1.22 SECURITY

A. Security Program:

1. Protect Work on existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
2. Initiate program at Project mobilization.
3. Maintain program throughout construction period until directed by Architect/Engineer.

1.23 DUST CONTROL

- A. Execute Work by methods that minimize raising dust from construction operations.
- B. Provide positive means to prevent airborne dust from dispersing into atmosphere.

1.24 EROSION AND SEDIMENT CONTROL

- A. Plan and execute construction by methods to control surface drainage from cuts and fills from borrow and waste disposal areas. Prevent erosion and sedimentation.
- B. Minimize surface area of bare soil exposed at one time.

1.25 NOISE CONTROL

- A. Provide methods, means and facilities to minimize noise produced by construction operations to level required by AHJ.

1.26 PEST AND RODENT CONTROL

- A. Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

1.27 POLLUTION CONTROL

- A. Comply with pollution and environmental control requirements of authorities having jurisdiction.
- B. The Contractor shall exercise every reasonable precaution to protect channels, storm drains, and bodies of water from pollution and shall conduct and schedule its operations so as to minimize or avoid muddying and silting of said channels, drains, and waters. Water pollution control work shall consist of constructing those facilities which may be required to provide prevention, control, and abatement of water pollution. Provide a Stormwater Pollution Prevention Plan (SPPP) as required by the Oregon Department of Environmental Quality. Submit for approval to DEQ and make corrections required. Pay the permit fee required by DEQ.

1.28 HAZARDOUS MATERIALS SPILLS

- A. If hazardous materials are released on the construction premises, a record of type of materials spilled, quantity, containment, cleanup, decontamination and disposal mechanisms used, reports made to regulatory agencies, and records of regulatory agency activity, if any, shall be kept by the Contractor and provided to Architect.
- B. Contractor and all subcontractors shall immediately report all spills of hazardous materials to Architect.
- C. The Contractor shall be responsible for spill containment, regulatory reporting, cleanup, decontamination, and waste disposal which meets OAR 340-12. See Section 017419 - Construction Waste Management, "Dangerous Waste Management," for additional information regarding disposal of hazardous materials.

1.29 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities and materials before Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary Work.
- C. Restore facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 015000

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.
- E. Damaged Products.
- F. General Product Requirements

1.2 PRODUCTS

- A. At minimum, comply with specified requirements and reference standards.
- B. Specified products define standard of quality, type, function, dimension, appearance and performance required.
- C. Furnish products of qualified manufacturers that are suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.
- D. Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.
 - 1. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.
 - 2. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Comply with delivery requirements in Section 017419 - Construction Waste Management and Disposal.
- B. Schedule delivery of products affecting Progress Schedule critical path to complete project within time of completion stated in the Agreement. Associated cost increases due to failure to meet accelerated delivery schedules and deliveries of long lead time products are responsibility of Contractor.
- C. Coordinate to avoid conflict with work and site conditions. Limit long term site storage, overcrowding of limited storage space, and conflict with available equipment and personnel for handling Products.

- D. Coordinate delivery to limit storage time for Products that are flammable, hazardous, easily damaged, subject to deterioration, or liable for theft or loss.
- E. Transport and handle products according to manufacturer's instructions.
- F. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products; use methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE REQUIREMENTS

- A. Store and protect products according to manufacturer's instructions.
- B. Store products with seals and labels intact and legible.
- C. Store sensitive products in weathertight, climate-controlled enclosures in an environment suitable to product.
- D. For exterior storage of fabricated products, place products on sloped supports aboveground.
- E. Provide bonded off-Site storage and protection when Site does not permit on-Site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products; use methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT HANDLING REQUIREMENTS

- A. Provide equipment and personnel necessary to handle Products, including those furnished by Owner, by methods to prevent soiling, damage, or loss of Products and protective packaging.
- B. Provide additional protection during handling as necessary to prevent scraping, marring, and other damage to Products and surrounding surfaces.
- C. Handle Products by methods to prevent bending or overstressing.
- D. Lift heavy components only at designated lifting points.

1.6 DAMAGED PRODUCTS

- A. Promptly remove damaged and deteriorated Products from premises. Replace with new undamaged materials conforming to Contract Documents.

1.7 PRODUCT OPTIONS

- A. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit Request for Substitution for any manufacturer not named, according to Section 012500 - Substitution Procedures.

PART 2 PRODUCTS

2.1 GENERAL PRODUCT REQUIREMENTS

- A. Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.
 - 1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
 - 2. Standard Products: Where available, provide standard products of types which have been produced and used previously and successfully on other projects and in similar application.
 - 3. Color and Appearance Consistency of Finish Materials: All finish materials of their respective kinds, in regards to construction phasing, shall be consistent in color and appearance throughout the total Project and shall be purchased out of one dye lot, production run, batch, etc., as applicable, for the total Project for each respective material.
- B. Additional Requirements: Material and equipment incorporated in to the work:
 - 1. Shall conform to applicable specifications and standards.
 - 2. Shall comply with size, make, type and quality specified or as specifically approved in writing by Architect.
 - 3. Shall be free of ASBESTOS, FORMALDEHYDE and LEAD.
 - 4. Manufactured and Fabricated Products:
 - a. Manufacture like parts of duplicate units to standard sizes and gauges; parts to be interchangeable.
 - b. Two or more items of the same kind to be identical and by same manufacturer (whether furnished under one Section or more).
 - c. Products shall be suitable for service conditions. Adhere to indicated equipment capacities, sizes, and dimensions unless variations are specifically approved in writing.
 - d. Except where field finishing is specified or otherwise required, products and fabricated items shall be pre-finished off-site.

- e. Do not use materials and equipment for other than designed or specified purposes and uses.

PART 3 EXECUTION - NOT USED

END OF SECTION 016000

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Starting of systems.
- B. Testing, adjusting, and balancing.
- C. Project record documents.
- D. Execution
- E. Cutting and patching.
- F. Special Procedures
- G. Protecting installed construction.

1.2 STARTING OF SYSTEMS

- A. Coordinate schedule for startup of various equipment and systems.
- B. Notify Architect/Engineer seven days prior to startup of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify that tests, meter readings, and electrical characteristics agree with those required by equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute startup under supervision of manufacturer's representative or Contractors' personnel according to manufacturer's instructions.
- G. When specified in individual Specification Sections, require manufacturer to provide authorized representative who will be present at Site to inspect, check, and approve equipment or system installation prior to startup and will supervise placing equipment or system in operation.
- H. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- I. Submit a report, PDF format preferred according to Section 013300 - Submittal Procedures that equipment or system has been properly installed and is functioning correctly.

1.3 TESTING, ADJUSTING, AND BALANCING

- A. Owner will appoint, employ, and pay for services of independent firm to perform testing, adjusting, and balancing.
- B. Reports will be submitted by independent firm to Architect/Engineer indicating observations and results of tests and indicating compliance or noncompliance with requirements of Contract Documents.

1.4 PROJECT RECORD DOCUMENTS

- A. Maintain on Site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed Shop Drawings, product data, and Samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record, at each product Section, description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates used.
 - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction as follows:
 - 1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in the Work, and change orders.
 - 2. Include locations of concealed elements of the Work.
 - 3. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components that are parallel to utilities.
 - 4. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.
 - 5. Identify and locate existing buried or concealed items encountered during Project.
 - 6. Measured depths of foundations in relation to finish floor datum.
 - 7. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

8. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 9. Field changes of dimension and detail.
 10. Details not on original Drawings.
 11. Provide photographs of congested areas before closed in by Gyp or finishes.
- G. Prepare draft record documents showing all as-built conditions and submit for review.
- H. Prepare and deliver pdf files to Owner within 60 days of Substantial Completion, final, accurate, and complete record Contract Documents, including without limitation record drawings and Specifications showing the exact "as-built" conditions of the Work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that existing Site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual Specification Sections.
- D. Verify that utility services are available with correct characteristics and in correct locations.
- E. Installer's Inspection of Conditions
1. Require Installer of each major unit of work to inspect substrate to receive the work, and conditions under which the work will be performed, and to report (in writing to Contractor) unsatisfactory conditions.
 2. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.
- F. Contractor's Inspection. Inspect each item of material or equipment immediately prior to installation, and reject damaged and defective items.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance according to manufacturer's instructions.
- B. Seal cracks or openings of substrate prior to applying next material or substance.

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

3.3 EXECUTION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
 - 1. Do not omit any preparatory step or installation procedure unless it is:
 - a. Verified with and accepted by Architect in writing.
 - b. Specifically modified or exempted by Contract Documents.
- C. Perform additional requirements that are specified which are greater than the manufacturer's requirements and do not have a deleterious effect on the product being installed.
- D. Verify that field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.
- E. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
 - 1. Secure Work true to line and level and within specified tolerances, or if not specified, industry-recognized tolerances.
 - 2. Physically separate products in place, provide electrical insulation, or provide protective coatings to prevent galvanic action or corrosion between dissimilar metals.
 - 3. Exposed Joints: Provide uniform joint width and arrange to obtain best visual effect. Refer questionable visual-effect choices to Architect/Engineer for final decision.
- F. Allow for expansion of materials and building movement.
- G. Climatic Conditions and Project Status: Install each unit of Work under conditions to ensure best possible results in coordination with entire Project.
 - 1. Isolate each unit of Work from incompatible Work as necessary to prevent deterioration.
 - 2. Coordinate enclosure of Work with required inspections, photographs and tests to minimize necessity of uncovering Work for those purposes.
- H. Mounting Heights: Where not indicated, mount individual units of Work at industry recognized standard mounting heights for particular application indicated.
 - 1. Refer questionable mounting heights choices to Architect/Engineer for final decision.

- 2. Elements Identified as Accessible to Handicapped: Comply with applicable codes and regulations.
- I. Adjust operating products and equipment to ensure smooth and unhindered operation.
- J. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction period. Lubricate operable components as recommended by manufacturer.

3.4 CUTTING AND PATCHING

- A. Employ skilled and experienced installers to perform cutting and patching.
- B. Submit request in advance of cutting or altering elements affecting:
 - 1. Structural integrity of element.
 - 2. Integrity of weather-exposed or moisture-resistant elements.
 - 3. Efficiency, maintenance or safety of element.
 - 4. Visual qualities of sight-exposed elements.
 - 5. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching, including excavation and fill to complete Work and to:
 - 1. Fit the several parts together, to integrate with other Work.
 - 2. Uncover Work to install or correct ill-timed Work.
 - 3. Remove and replace defective and nonconforming Work.
 - 4. Remove samples of installed Work for testing.
 - 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Structural Work: Conform to Structural requirements for cutting of structural members. Do no cutting of structural elements that could reduce structural load capacity, deflection ratio, or integrity of structural systems without prior direction from Structural Engineer.
- E. Mechanical Work: Refer to Division 23.
- F. Electrical Work: Refer to Division 26.
- G. Execute Work by methods to avoid damage to other Work and to provide proper surfaces to receive patching and finishing.
- H. Cut masonry and concrete materials using masonry saw or core drill.
- I. Restore Work with new products according to requirements of Contract Documents.
- J. Fit Work tight to pipes, sleeves, ducts, conduits and other penetrations through surfaces.

- K. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- L. At penetrations of fire-rated walls, partitions, ceiling, or floor construction, completely seal voids with material according to Section 078400 - Firestopping, to full thickness of penetrated element.
- M. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.
- N. Identify hazardous substances or conditions exposed during the Work to Architect/Engineer for decision or remedy.
- O. Leave areas clean and free from debris. Remove spillage, soiling, sealants and overspray from finished surfaces.

3.5 PROTECTING INSTALLED CONSTRUCTION

A. In-Place Protection

1. General

- a. During handling and installation of work at project site, clean and protect work in progress and adjoining work on a basis of perpetual maintenance.
 - b. Clean and perform maintenance on newly installed work as frequently as necessary through remainder of construction period.
 - c. Adjust and lubricate moving components to ensure operability without damaging effects. Contractor is responsible for function, condition and unblemished appearance of all work on Project, and any item or work judged defective by Architect shall be subject to replacement at no additional cost to Owner.
- B. To extent possible through reasonable control and protection methods, supervise performance of work in a manner and by means which will ensure that none of the work, whether completed or in progress, will be subjected to harmful, dangerous, damaging, or otherwise deleterious exposures during construction period.
 - C. Protect installed Work and provide special protection where specified in individual Specification Sections.
 - D. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.
 - E. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
 - F. Use durable sheet materials to protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.
 - G. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

- H. Prohibit traffic from landscaped areas.
- I. Remove protective devices when no longer needed, prior to completion of work

3.6 SPECIAL PROCEDURES

- A. Materials: As specified in product sections; match existing with new products and salvaged products for patching and extending work.
- B. Employ skilled and experienced installer to perform alteration work.
- C. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.
- D. Remove unsuitable material not marked for salvage, including rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.
- E. Remove debris and abandoned items from area and from concealed spaces.
- F. Prepare surface and remove surface finishes to permit installation of new work and finishes.
- G. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
- H. Remove, cut, and patch Work in manner to minimize damage and to permit restoring products and finishes to original condition.
- I. Refinish existing visible surfaces to remain in renovated rooms and spaces, to specified condition for each material, with neat transition to adjacent finishes.
- J. Where new Work abuts or aligns with existing, provide smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
- K. When finished surfaces are cut so that smooth transition with new Work is not possible, terminate existing surface along straight line at natural line of division and submit recommendation to Architect for review.
- L. Where change of plane of 1/4 inch or more occurs, submit recommendation for providing smooth transition to Architect for review.
- M. Trim existing doors to clear new floor finish. Refinish trim to original condition.
- N. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- O. Finish surfaces as specified in individual product sections.

END OF SECTION 017000

This page intentionally left blank

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. General Requirement for Recycling.
 - 2. Construction waste management plan.
 - 3. Construction waste recycling.

1.2 WASTE MANAGEMENT GOALS

- A. The Owner desires that this project generate the least amount of waste possible and that the Contractor employ processes to minimize the generation of waste due to error, poor planning, breakage, mishandling, contamination, or other factors.
- B. Of the waste material that is generated, as much as economically feasible shall be reused, salvaged, or recycled.
 - 1. Recycle and/or salvage at least 85% of the non-hazardous construction and demolition debris.

1.3 GENERAL REQUIREMENTS FOR RECYCLING

- A. The General Contractor shall be responsible for:
 - 1. Sorting, segregating, recycling, and placing designated waste materials into containers, and for disposing of all unacceptable and dangerous wastes as defined below.
 - 2. Furnish waste and recycle collection containers, service those containers, and dispose of solid waste from the project, including unacceptable and dangerous waste.
 - 3. Maintain recycling and adaptive reuse storage and collection area in orderly arrangement with materials clearly separated to eliminate co-mingling of unsuitable materials.
- B. Waste which is disposed of by the General Contractor shall be in accordance with all applicable local, state and federal regulations, including ORS Chapter 459 Solid Waste Management and ORS 466.100, Disposal of Waste Restricted.
 - 1. Onsite recycling bins shall be well marked and easily distinguishable from waste bins. Each recycle bin shall be marked according to its contents.

1.4 PLAN REQUIREMENTS

- A. Develop and implement construction waste management plan.
- B. Intent:
 - 1. Divert construction, demolition, and land-clearing debris from landfill disposal.

2. Redirect recyclable material back to manufacturing process.
3. Generate cost savings or increase minimal additional cost to Project for waste disposal.

1.5 SUBMITTALS

- A. Section 013300 - Submittal Procedures contains requirements for submittals.
- B. Construction Waste Management Plan: Submit construction waste management plan describing methods and procedures for implementation and monitoring compliance including the following:
 1. Transportation company hauling construction waste to waste processing facilities.
 2. Recycling and adaptive reuse processing facilities and waste type each facility will accept.
 3. Construction waste materials anticipated for recycling and adaptive reuse.
 4. On-Site sorting and Site storage methods.
- C. Submit documentation prior to Substantial Completion substantiating construction waste management plan was maintained and goals were achieved.
 1. Trash: Quantity by weight deposited in landfills. Include associated fees, transportation costs, container rentals, and taxes for total cost of disposal.
 2. Salvaged Material: Quantity by weight with destination for each type of material salvaged for resale, recycling, or adaptive reuse. Include associated fees, transportation costs, container rentals, taxes for total cost of disposal, and reimbursements due to salvage resale.
 3. Total Cost: Indicate total cost or savings for implementation of construction waste management plan.

1.6 CONSTRUCTION WASTE MANAGEMENT PLAN

- A. Construction Waste Landfill Diversion: Minimum 85 percent by weight of construction waste materials for duration of Project through resale, recycling, or adaptive reuse.
- B. Implement construction waste management plan at start of construction.
- C. Distribute approved construction waste management plan to Subcontractors and others affected by plan requirements.
- D. Oversee plan implementation, instruct construction personnel for plan compliance, and document plan results.
- E. Dangerous Waste Management:
 1. Dangerous waste generated during the project shall be identified, accumulated and disposed in accordance with ORS 466.100. General Contractor generated dangerous waste must be shipped for disposal within 90 days of generation.

2. General Contractor shall dispose dangerous waste only through vendor(s) approved by owner. General Contractor shall arrange all dangerous waste shipments. Utilization of the vendor and facilities included in the State of Oregon Hazardous Waste Disposal contract is authorized. Any other proposed vendor(s) and/or facilities are subject to audit by owner, prior to utilization. General Contractor shall pay for said audits.

F. Purchase products to prevent waste by:

1. Ensuring correct quantity of each material is delivered to Site.
2. Choosing products with minimal or no packaging.
3. Requiring suppliers to use returnable pallets or containers.
4. Requiring suppliers to take or buy back rejected or unused items.

1.7 CONSTRUCTION WASTE RECYCLING

- A. Use source separation method or comingling method suitable to sorting and processing method of selected recycling center. Dispose nonrecyclable trash separately into landfill.
- B. Source Separation Method: Recyclable materials separated from trash and sorted into separate bins or containers, identified by waste type, prior to transportation to recycling center.
- C. Comingling Method: Recyclable materials separated from trash and placed in unsorted bins or container for sorting at recycling center.
- D. Materials suggested for recycling include:
 1. Packing materials including paper, cardboard, foam plastic, and sheeting.
 2. Recyclable plastics.
 3. Organic plant debris.
 4. Earth materials.
 5. Metals.
 6. Gypsum products.
 7. Acoustical ceiling tile.
 8. Carpet.
 9. Equipment oil.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.
- C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- D. Meetings: Discuss trash/waste management goals and issues at project meetings.
 - 1. Pre-bid meeting.
 - 2. Pre-construction meeting.
 - 3. Regular job-site meetings.

3.2 CONSTRUCTION WASTE COLLECTION

- A. Collect construction waste materials in marked bins or containers and arrange for transportation to recycling centers or adaptive salvage and reuse processing facilities.
- B. Maintain recycling and adaptive reuse storage and collection area in orderly arrangement with materials separated to eliminate co-mingling of materials required to be delivered separately to waste processing facility.
- C. Store construction waste materials to prevent environmental pollution, fire hazards, hazards to persons and property, and contamination of stored materials.
- D. Cover construction waste materials subject to disintegration, evaporation, settling, or runoff to prevent polluting air, water, and soil.

3.3 CONSTRUCTION WASTE DISPOSAL

- A. Deliver construction waste to waste processing facilities. Obtain receipt for deliveries.
- B. Dispose of construction waste not capable of being recycled or adaptively reused by delivery to landfill, incinerator, or other legal disposal facility. Obtain receipt for deliveries.

3.4 SITE MAINTENANCE

- A. Do not use the Owner's waste containers for construction waste.

- B. Dispose daily of flammable, hazardous and toxic waste materials. Dispose of trash and debris in compliance with governing codes, ordinances, regulations and anti-pollution laws.
- C. Locate dumpster(s) at a site designated by the Owner.

END OF SECTION 017419

This page intentionally left blank

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Closeout procedures.
- B. Demonstration and instructions.
- C. Operation and maintenance data.
- D. Product warranties and product bonds.
- E. Final cleaning.

1.2 CLOSEOUT PROCEDURES

- A. Prerequisites to Substantial Completion: Complete following items before requesting Certification of Substantial Completion, either for entire Work or for portions of Work:
 - 1. Submit maintenance manuals, Project record documents, digital images of construction photographs and other similar final record data in compliance with this Section.
 - 2. Complete facility startup, testing, adjusting, balancing of systems and equipment, demonstrations and instructions to Owner's operating and maintenance personnel as specified in compliance Contract Documents.
 - 3. Conduct inspection to establish basis for request that Work is substantially complete. Create comprehensive list (initial punch list) indicating items to be completed or corrected, value of incomplete or nonconforming Work, reason for being incomplete, and date of anticipated completion for each item. Include copy of list with request for Certificate of Substantial Completion.
 - 4. Obtain and submit releases enabling Owner's full, unrestricted use of Project and access to services and utilities. Include certificate of occupancy, operating certificates, and similar releases from authorities having jurisdiction and utility companies.
 - 5. Insurance: Advise Owner of insurance change-over requirements.
 - 6. Deliver tools, spare parts, extra stocks of material, and similar physical items to Owner.
 - 7. Make final change-over of locks and transmit keys directly to Owner. Advise Owner's personnel of change-over in security provisions.
 - 8. Discontinue or change over and remove temporary facilities and services from Project Site, along with construction tools, mockups, and similar elements.
 - 9. Perform final cleaning according to this Section.
- B. Substantial Completion Inspection:
 - 1. When Contractor considers Work to be substantially complete, submit to Architect/Engineer:

- a. Written certificate that Work, or designated portion, is substantially complete.
 - b. List of items to be completed or corrected (initial punch list).
2. Within seven days after receipt of request for Substantial Completion, Architect/Engineer will make inspection to determine whether Work or designated portion is substantially complete.
3. Should Architect/Engineer determine that Work is not substantially complete:
 - a. Architect/Engineer will promptly notify Contractor in writing, stating reasons for its opinion.
 - b. Contractor shall remedy deficiencies in Work and send second written request for Substantial Completion to Architect/Engineer.
 - c. Architect/Engineer will re-inspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Architect/Engineer's inspection.
4. When Architect/Engineer finds that Work is substantially complete, Architect/Engineer will:
 - a. Prepare Certificate of Substantial Completion on AIA G704 - Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected as verified and amended by Architect/Engineer and Owner (final punch list).
 - b. Submit Certificate to Owner and Contractor for their written acceptance of responsibilities assigned to them in Certificate.
5. After Work is substantially complete, Contractor shall:
 - a. Allow Owner occupancy of Project under provisions stated in Certificate of Substantial Completion.
 - b. Complete Work listed for completion or correction within time period stipulated.
6. Owner will occupy portions of building as specified in Section 011000 - Summary.
- C. Prerequisites for Final Completion: Complete following items before requesting final acceptance and final payment.
 1. When Contractor considers Work to be complete, submit certification that:
 - a. Contract Documents have been reviewed.
 - b. Work has been examined for compliance with Contract Documents.
 - c. Work has been completed according to Contract Documents.
 - d. Work is completed and ready for final inspection.
 2. Submittals: Submit following:

- a. Final punch list indicating all items have been completed or corrected.
 - b. Final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 - c. Specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents.
 - d. Accounting statement for final changes to Contract Sum.
 - e. Contractor's affidavit of payment of debts and claims on AIA G706 - Contractor's Affidavit of Payment of Debts and Claims.
 - f. Contractor affidavit of release of liens on AIA G706A - Contractor's Affidavit of Release of Liens.
 - g. Consent of surety to final payment on AIA G707 - Consent of Surety to Final Payment Form.
 - h. Other Submittals Not Listed: Submit as required by State and Local agencies, Agreement, and Contracting Requirements.
3. Perform final cleaning for Contractor-soiled areas according to this Section.
- D. Final Completion Inspection:
1. Within seven days after receipt of request for final inspection, Architect/Engineer will make inspection to determine whether Work or designated portion is complete.
 2. Should Architect/Engineer consider Work to be incomplete or defective:
 - a. Architect/Engineer will promptly notify Contractor in writing, listing incomplete or defective Work.
 - b. Contractor shall remedy stated deficiencies and send second written request to Architect/Engineer that Work is complete.
 - c. Architect/Engineer will re-inspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Architect/Engineer's inspection.
- E. Following determination that Work is complete, Owner's Representative and Architect will make recommendation to Owner for acceptance of Final Acceptance of Work.
- F. Owner's Representative will issue Final Acceptance letter after determination that requirements for Final Completion have been fulfilled.

- G. Should Owner's Representative and Architect be required to perform more than two reviews for Substantial Completion or Final Completion, due to failure of the Work to conform to completion status claimed by Contractor:
 - 1. Contractor will compensate Owner's Representative and Architect on a time and expense basis at customary hourly rate for each additional review.
 - 2. Compensation will be deducted from Contractor's Final Progress Payment.

1.3 DEMONSTRATION AND INSTRUCTIONS

- A. The Contractor must train Owner maintenance personnel in the operation and maintenance of mechanical and electrical equipment and other products identified in Contract Documents. Coordination must be maintained with systems designers for developing the hours of instruction and scope of material to be covered. Training of Owner personnel must not begin until the Architect has approved the final submittal copy of the Operation and Maintenance Manual.
- B. Demonstrate Project equipment instructed by qualified representative who is knowledgeable about the Project.
- C. Video Recordings: Provide high-quality color video recordings of demonstration and instructional sessions. Engage approved videographer to record sessions. Include classroom instructions, demonstrations, board diagrams, and other visual aids.
- D. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- E. Use operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- F. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at designated location.
- G. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- H. Required instruction time for each item of equipment and system is specified in individual Specification Sections.
- I. At each training session, provide a sign-in sheet for signature of all Owner staff in attendance. Identify the sign-in sheet with the training being provided and the date of the training. Submit the sign-in sheet(s) before Final Acceptance.

1.4 OPERATION AND MAINTENANCE DATA

- A. Submit PDF copy of preliminary draft prior to Substantial Completion. Architect/Engineer will review draft and return one copy with comments. Revise content of document sets as required prior to final submission.
- B. Submit final copy in PDF composite electronic indexed file at Substantial Completion.

- C. Prepare media cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of Project.
- D. Internally subdivide media contents with permanent page dividers, logically organized as described below.
- E. Drawings: Provide scalable PDF copies in media requested.
- F. Contents: Prepare table of contents for media, with each product or system description identified, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by Section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Include the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
 - g. Safety precautions to be taken when operating and maintaining or working near equipment.
 - 3. Part 3: Project documents and certificates, including the following:
 - a. Shop Drawings and product data.
 - 1) Air and water balance reports.
 - b. Certificates.
 - c. PDF copies of warranties and bonds. Deliver original to Owner in separate bound folder in CSI format.

1.5 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed by responsible Subcontractors, suppliers and manufacturers within ten days after completion of applicable item of Work.

- B. Execute and assemble transferable warranty documents and bonds from Subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information and are notarized.
- D. Co-execute submittals when required.
- E. Include table of contents and assemble in three D side ring binder with durable plastic cover. Maintain a PDF copy for O&M manual at project closeout.
- F. Submit prior to final Application for Payment.
- G. Warranties shall be dated for length of time specified from date of Substantial Completion and will be rejected if dated otherwise.
 - 1. Two Year Warranty of Contractor.
 - a. Contractor warrants to Metro that materials and equipment provided under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects and contaminants not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty will be for at least two (2) full years from Substantial Completion of the Project, regardless of the length of manufacturers' or installers' warranties
 - 2. Repair Warranty
 - a. In addition to any other warranties that are required, the Contractor must make all necessary repairs and replacements to remedy any and all defects, breaks, or failures of the Work occurring within two (2) years following the date of Substantial Completion due to faulty or inadequate materials or workmanship. Such repairs and replacements must conform to the Contract Specifications under which the Contractor originally performed the work.
- H. Time of Submittals:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
 - 2. Make other submittals within ten days after date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 FINAL CLEANING

- A. Execute final cleaning prior to final Project assessment.
 - 1. Employ experienced personnel or professional cleaning firm.
- B. Clean remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces; and vacuum carpeted and soft surfaces.
- C. Clean equipment and fixtures to sanitary condition with appropriate cleaning materials.
- D. Replace filters of operating equipment.
- E. Remove waste and surplus materials, rubbish, and construction facilities from Site.

3.2 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit final accounting statement to Architect making final adjustments to original Contract Sum.
- B. Indicate Original Contract Sum and determine Total Adjusted Contract Sum from additions and deductions resulting from previous Change Orders, Alternates, Unit prices, and other adjustments.
- C. Deduct previous payments from adjusted Contract Sum to determine Total Contract Sum remaining due.
- D. Architect will prepare final Change Order reflecting approved adjustments to Contract Sum not previously made by other Change Orders.

3.3 FINAL APPLICATION FOR PAYMENT

- A. Submit final Application for Payment in accordance with the Contracting Requirements, and procedures and requirements of Owner, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

END OF SECTION 017700

This page intentionally left blank

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sustainable design project goals.
 - 2. Sustainable design product requirements.

1.2 REFERENCE STANDARDS

- A. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE):
 - 1. ASHRAE 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.
 - 2. ASHRAE 62.1 - Ventilation for Acceptable Indoor Air Quality.
 - 3. ASHRAE 90.1 - Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings.
- B. California Department of Health Services (CA/DHS):
 - 1. CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.
- C. Carpet and Rug Institute (CRI):
 - 1. CRI Green Label Plus Testing Program.
 - 2. CRI Green Label Testing Program.
- D. Green Seal (GS):
 - 1. GC-03 - Anti-Corrosive Paints.
 - 2. GS-36 - Aerosol Adhesives.
- E. GREENGUARD Environmental Institute:
 - 1. GREENGUARD Gold Certification.
- F. Scientific Certification Systems (SCS):
 - 1. SCS EC10.2 - Environmental Certification Program Indoor Air Quality Performance.
- G. Sheet Metal and Air Conditioning Contractors (SMACNA):
 - 1. SMACNA IAQ - IAQ Guidelines for Occupied Buildings Under Construction.
- H. South Coast Air Quality Management District (SCAQMD):

1. SCAQMD Rule 1113 - Architectural Coatings.
2. SCAQMD Rule 1168 - Adhesive and Sealant Applications.
- I. U.S. Environmental Protection Agency (EPA):
 1. ENERGY STAR Voluntary Labeling Program.
 2. EPA IAQ Testing - Compendium of Methods for the Determination of Air Pollutants in Indoor Air.
 3. EPA Construction General Permit.

1.3 SUSTAINABLE PROJECT GOALS

- A. Minimize Embodied and Operational Carbon Emissions.
- B. Protect and restore site habitats and ecosystems.
- C. Use building products that are working to minimize their environmental and health impacts.

1.4 SUBMITTALS

- A. Section 013300 - Submittal Procedures contains requirements for submittals.
- B. Construction Plans:
 1. Construction Waste Management Plan: Provide according to Section 017419 - Construction Waste Management and Disposal.
 2. Construction Indoor Air Quality (IAQ) Plan: Provide according to Section 013546 – Indoor Air Quality Procedures.

PART 2 PRODUCTS

2.1 PROHIBITED MATERIALS

- A. Do not use materials containing asbestos, polychlorinated biphenyls (PCB), or other hazardous materials.
 1. This project seeks to avoid, to the greatest extent possible, materials constructed of or containing these ingredients:
 - a. Formaldehyde, polyvinyl chloride (PVC), Neoprene, cadmium, flame retardant wood treatment, halogenated flame retardants, Creosote, arsenic, or pentachlorophenol, chlorofluorocarbon (CFC), hydrochlorofluorocarbon (HCFC), petrochemical fertilizers and pesticides, phthalates, mercury, lead, chloroprene (Neoprene), chlorinated polyethylene, and chlorosulfonated polyethylene.
- B. Do not use HCFC-based refrigerants or halon extinguishing agents.
- C. Do not use materials containing butyl for interior locations.

PART 3 EXECUTION

3.1 INDOOR ENVIRONMENTAL QUALITY

- A. Meets CDPH Standard Method emissions criteria.
- B. VOC Content Requirements for Wet Applied Products:
 - 1. All paints and coatings wet -applied on site must meet the applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAMD) Rule 1113 as of February 16, 2016.
 - 2. All adhesives and sealants wet-applied on site must meet the applicable chemical content requirements of SCAQMD Rule 1168, amended October 26, 2017, Adhesive and Sealant Applications, as analyzed by the methods specified in Rule 1168. The provisions of SCAQMD rule 1168 do not apply to adhesives and sealants subject to state or federal consumer product VOC requirements.
- C. Accept absorptive materials on-Site in manufacturer's sealed, protective packaging. Inspect for damage.
- D. Store absorptive materials in enclosed, environmentally conditioned space to prevent moisture absorption.
- E. Do not store or install absorptive materials within building until building is enclosed and materials are protected from exposure to elements.
- F. Protect installed absorptive materials from damage with temporary exterior enclosure to prevent moisture absorption.
- G. Perform ventilation Work according to ASHRAE 62.1.
- H. Develop and implement Construction IAQ management plan including the following:
 - 1. Comply with minimum requirements of SMACNA IAQ.
 - 2. Protect stored and installed absorptive materials from moisture damage.
 - a. Store materials on elevated platforms under cover and in dry location.
 - b. When materials are not stored in enclosed location, cover tops and sides of material with secured waterproof sheeting.
 - 3. Protect HVAC equipment during construction.
 - a. Shut down return side of HVAC system whenever possible during heavy construction or demolition.
 - b. When HVAC system is operated during heavy construction, furnish disposable temporary filters.

4. Replace filtration media immediately before occupancy.

END OF SECTION 018113

DIVISION 02
EXISTING CONDITIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes
 - 1. Selective demolition of building elements for alteration purposes.
 - a. Protecting items designated to remain.
 - b. Removing demolished materials.

1.2 REFERENCE STANDARDS

- A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.3 SUBMITTALS

- A. Demolition Plan: Submit demolition plan as required by OSHA and local AHJs.
 - 1. Indicate extent of demolition, removal sequencing, and location and construction of barricades and fences.
 - 2. Revise as necessary after review by A/E and Owner. Do not proceed until approved plan is received.
- B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.4 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
 - 1. Minimum of 3 years of documented experience on projects of similar size, complexity and scope and with service facilities within 50 miles of Project.

1.5 PROJECT CONDITIONS

- A. The Contractor is responsible for the safety of his workmen and shall follow all WISHA rules and regulations. The Contractor shall provide respirators when recommended or required.
- B. Conduct demolition to minimize interference with adjacent buildings that are to remain in operation.
- C. Notify Architect/Engineer immediately if existing conditions differ from shown on construction documents.

1.6 SCHEDULING

- A. Section 013216 - Construction Progress Schedule: Requirements for scheduling.

- B. Schedule Work to coincide with new construction.
- C. Cooperate with Owner in scheduling noisy operations and waste removal that may impact Owners operation and activities in adjoining spaces.
- D. Coordinate utility and building service interruptions with Owner.
 - 1. Do not disable or disrupt building fire or life safety systems without three days prior written notice to Owner and AHJ.
 - 2. Schedule tie-ins to existing systems to minimize disruption.
 - 3. Coordinate Work to ensure fire sprinklers, fire alarms, smoke detectors, emergency lighting, exit signs and other life safety systems remain in full operation in occupied areas.

1.7 PRE-DEMOLITION MEETINGS

- A. Convene minimum one week prior to commencing work of this section.
- B. Review with Owner's Representative and building occupants the approved Demolition Schedule. Discuss closures, shutdowns and operational impacts.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.1 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Provide, erect, and maintain temporary barriers and security devices.
 - 3. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 - 4. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Protect existing structures and other elements to remain in place and not removed.
- D. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- E. Perform demolition in a manner that maximizes salvage and recycling of materials.

1. Dismantle existing construction and separate materials.
 2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.
- F. Do not burn or bury materials on site. Leave site in clean condition.

3.2 EXISTING UTILITIES

- A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.3 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Remove materials not to be reused on site; comply with requirements of Section 017419 - Waste Management.
- C. Leave site in clean condition, ready for subsequent work.
- D. Remove temporary Work.

END OF SECTION 024100

This page intentionally left blank

DIVISION 07

THERMAL AND MOISTURE PROTECTION

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes
 - 1. Sealants and joint backing.
 - 2. Accessories.

1.2 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
 - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 - 2. List of backing materials approved for use with the specific product.
 - 3. Backing material recommended by sealant manufacturer.
 - 4. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 - 5. Substrates the product should not be used on.
 - 6. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Samples: Submit one sample, 2 x 1/4 inch in size illustrating sealant colors for each product selection.
- E. Warranty: Include coverage for installed sealants and accessories failing to achieve airtight or watertight seal, exhibit loss of adhesion or cohesion, and sealants which do not cure.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section and with at least five years of documented experience.

1.4 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements.
- B. Do not proceed with installation of joint sealants under the following conditions:
 - 1. Temperature and humidity conditions are outside the limits recommended by sealant manufacturer during and after installation or are below 40 deg F.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 PRODUCTS

2.1 DESIGN REQUIREMENTS

- A. Meet emissions testing and requirements of CDPH Standard Test Method v1.1.
 - 1. VOC Content Requirements for Wet Applied Products: All adhesives, sealants and sealant primers wet-applied on site must meet the applicable chemical content requirements of SCAQMD Rule 1168, amended October 26, 2017, Adhesive and Sealant Applications, as analyzed by the methods specified in Rule 1168. The provisions of SCAQMD rule 1168 do not apply to adhesives and sealants subject to state or federal consumer product VOC requirements.
 - 2. Avoid halogenated flame retardants, orthophthalates, formaldehyde, and styrene.
 - 3. Prefer caulk type sealants.

2.2 ACCEPTABLE MANUFACTURERS

- A. General Interior (Type GI)
 - 1. Pecora, AC-20 + Silicone.
 - 2. Tremco, Tremflex 834.
- B. Substitutions under provisions of Section 012500.

2.3 JOINT SEALANT APPLICATIONS

- A. Scope:
 - 1. Interior Joints:
 - a. Do not seal interior joints indicated on drawings as not sealed.

- b. Do not seal through-penetrations in sound-rated assemblies that are also fire-rated assemblies.
- c. Seal the following joints:
 - 1) Joints between door frames and window frames and adjacent construction.

2.4 JOINT SEALANTS - GENERAL

- A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.
- B. Compatibility: Provide joint sealants, backings and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.
- C. Colors: Unless otherwise specified, match color of adjacent material occurring in same plane. Where joints occur adjacent to two or more material colors in same plane, match color of lighter adjacent material, unless otherwise directed. Custom colors for exposed sealants may be required if standard colors are not acceptable to the Architect.

2.5 NONSAG ELASTOMERIC JOINT SEALANTS

- A. General: Comply with ASTM C920 and other requirements indicated for each liquid applied chemically curing sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Type GI (General Interior) General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF, single component, paintable.
 - 1. Applications: Use for interior non moving wall and ceiling control joints, joints between door and window frames and wall surfaces, and other interior joints for which no other type of sealant is indicated.

2.6 ACCESSORIES

- A. Sealant Backing Materials, General: Materials placed in joint before applying sealants; assists sealant performance and service life by developing optimum sealant profile and preventing three-sided adhesion; type and size recommended by sealant manufacturer for compatibility with sealant, substrate, and application.
 - 1. Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- C. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

- D. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- E. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

3.2 PREPARATION

- A. Surface cleaning of joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove loose materials and foreign matter that could impair adhesion of sealant.
 - a. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt and frost.
- B. Prime as necessary, in accordance with manufacturer's instructions.
 - 1. Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.3 INSTALLATION

- A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Provide joint sealant installations complying with ASTM C1193.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
 - 1. Do not leave gaps between ends of sealant backings.

2. Do not stretch, twist, puncture or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond breaker backing tape where backer rod cannot be used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces at the same time backings are installed.
 1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.
 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- G. Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint. Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
 1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

3.4 CLEANING

- A. Section 017700 - Closeout Procedures: Final cleaning.
- B. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 017000 - Execution: Protecting installed construction.
- B. Protect sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 SCHEDULE

- A. Unless noted otherwise, provide sealant at 1) all joints in similar/same materials; 2) all joints between dissimilar materials and 3) in all cracks of any size. For joints or cracks exceeding $\frac{1}{4}$ inch in width, use appropriately sized foam backer rod in addition to sealant.

END OF SECTION 079200

DIVISION 08

OPENINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes hollow metal frames.
 - 1. Provide frames for interior glazed lites.
 - 2. Provide frames for interior doors.

1.2 SUBMITTALS

- A. Section 013300 - Submittal Procedures.
- B. Shop Drawings: Indicate frame elevations, reinforcement, anchor types and spacing, location of cut-outs for hardware, and finish.
- C. Provide a schedule of doors and frames using same reference numbers for details and door openings as those on the contract documents. Highlight fire rated doors.
- D. Section 017823 - Operation and Maintenance Data.
- E. Product Maintenance Data: Include dent and scratch repair.

1.3 QUALITY ASSURANCE

- A. Conform to requirements of SDI-100.
- B. Qualifications:
 - 1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
 - 2. Member Steel Door Institute (SDI).
 - 3. Provide steel doors and frames from single manufacturer.
- C. Fire Rated Frame Construction: Conform to NFPA 252.
- D. Attach label from agency approved by authority having jurisdiction to identify each fire rated door frame.
 - 1. Attach smoke label to smoke and draft control door frames.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Storage and Handling.
- B. Accept frames on site in manufacturer's packaging. Inspect for damage.
- C. Break seal on-site to permit ventilation.

- D. Maintain protected area on site for storage of frames to be installed. Door frames must be stored on pallets or wood sleepers. Do not store directly on earth or concrete.
- E. Handle frames in such a way as to avoid damage or scratches.
- F. Any rust discovered on door frames during construction will result in rejection and replacement of door frame.

PART 2 PRODUCTS

2.1 STANDARD HOLLOW METAL FRAMES

- A. Manufacturers:
 - 1. Curries Assa Abloy.
 - 2. Allegion Steelcraft.
 - 3. Stiles Steel Door + Window Systems.
 - 4. Substitutions: As specified in Section 012500 - Substitution Procedures.
- B. Product Description: Standard shop fabricated galvanized steel frames, rated and non-rated types.
 - 1. Interior Frames:
 - a. Level 3, nominal 16 gage/0.053 inch thick material, base metal thickness.

2.2 ACCESSORIES

- A. Removable Stops: Rolled steel channel shape, mitered corners; prepared for countersink style tamper proof screws.
- B. Primer: ANSI/SDI Standard A250.10 factory applied.
- C. Silencers: Specified in Section 087100 - Door Hardware.
- D. Weatherstripping and Smoke Seals: Specified in Section 087100 - Door Hardware.
- E. Interior Door Frames Sound Deadening Insulation: Fiberglass batt or mineral wool.
- F. Hollow Metal Panel
 - 1. Basis of Design: Mapes Panel.
 - 2. Thickness: 1 inch.
 - 3. Core: 2 lb density polystyrene.
 - 4. Substrates: Steel.
 - a. Finish: Kynar/Hylar.

b. Color: To be selected.

- G. Grout for Frames in Masonry: Mortar grout complying with ASTM C476 with maximum slump of 4 inches as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.

2.3 PROVISION FOR HARDWARE

- A. Hardware Reinforcement: Conform to ANSI A156.115 and ANSI A250.6. Factory reinforce, drill, and tap frames to receive mortised hinges, locks, latches, flush bolts, and concealed door closers.
- B. Use hardware templates furnished by hardware manufacturer.
- C. Hardware Reinforcing: Steel, meet or exceed following:
1. Hinges: 7 gauge.
 2. Surface Closers: 12 gauge plate reinforcements welded to frames according to type of door closer installation.
- D. Door Silencers: Drill door frame stops to receive silencers at each door swing. Insert plastic plugs to keep holes open during painting and construction activities.
- E. Plaster Guards: Provide at silencers, strike pockets, and hinge reinforcements.
- F. Finish Hardware Locations: Refer to Section 087100 - Door Hardware.
- G. Field Tapping and Drilling: Accepted at surface-applied hardware.

2.4 FABRICATION

- A. Fabricate frames as full welded units. Knock down frames are not acceptable.
- B. Mullions for Double Doors: Removable type, of same profiles as jambs.
- C. Transom Bars for Glazed Lites: Fixed type, of same profiles as jamb and head.
- D. Fabricate frames with hardware reinforcement plates welded in place. Provide mortar guard boxes. Provide heavy duty hinge plate reinforcements with a minimum of 1" continuous weld at top and bottom.
- E. Plaster Guards: Weld 16 gauge steel plaster guards or mortar boxes to frame at back of finish hardware cutouts where finish materials might obstruct hardware operation.
- F. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.
- G. Prepare frames for silencers. Provide three single silencers for single doors and mullions of double doors on strike side. Provide two single silencers on frame head at double doors without mullions.
- H. Do not provide silencers on frames to be provided with smoke seals or conflicting weatherstripping.

- I. Attach fire rated label to each fire rated frame.
- J. Fabricate frame profiles as detailed on the drawings.

2.5 SHOP FINISHING

- A. Thoroughly clean and chemically treat for maximum adhesion.
- B. Interior Frames: Compatible with finish paint specified of Section 099000 - Painting and Coating.
 - 1. Baked-On Shop Primer: ANSI/SDI Standard A250.10 factory applied, baked-on rust inhibiting paint. Color: Light gray.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes and tolerances are acceptable.

3.2 FRAMES INSTALLATION

- A. Install frames in accordance with SDI-100 and DHI. Countersink anchor screws, putty, prime and paint to provide concealed anchor finish.
- B. Coordinate with masonry, steel stud or concrete wall construction for anchor placement.
- C. Coordinate installation of frames with installation of hardware specified in Section 087100 - Door Hardware, and doors in Section 081313 - Hollow Metal Doors.
- D. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.
- E. Install fiberglass insulation in non-rated frames, and mineral wool in rated frames, for sound deadening.

3.3 ERECTION TOLERANCES

- A. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

3.4 CLEANING

- A. Thoroughly clean surfaces. Sand scarred and rusty areas smooth and touch up with compatible primer to shop primer and finish paint as specified in Section 099000.

3.5 SCHEDULE

- A. Refer to Door and Frame Schedule in the drawings.

END OF DOCUMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Non-rated and Rated Interior Hollow Metal Doors.

1.2 SUBMITTALS

- A. Section 013300 - Submittal Procedures.
- B. Shop Drawings: Indicate door elevations, internal reinforcement, closure method, cut-outs for glazing, and finishes.
- C. Product Data: Submit door configurations, location of cut-outs for hardware reinforcement.
- D. Product Maintenance Manual: Submit recommended areas to be inspected and inspection intervals. Include dent and scratch repair.

1.3 QUALITY ASSURANCE

- A. Conform to requirements of SDI-100/ANSI A250.8.
- B. Fire Rated Door Construction: Conform to NFPA 252 requirements.
- C. Installed Fire Rated Door and Panel Assembly: Conform to NFPA 80 for fire rated class as indicated on Drawings.
- D. Attach label from agency approved by authority having jurisdiction to identify each fire rated door.
- E. Qualifications:
 - 1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
 - 2. Member of Steel Door Institute (SDI).
 - 3. Provide steel doors and frames from single manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements.
- B. Protect doors with resilient packaging sealed with heat shrunk plastic.
- C. Break seal on site to permit ventilation.
- D. Any rust discovered on doors during construction will result in the rejection of door and require replacement.

1.5 COORDINATION

- A. Coordinate frame installation with size, location, and installation of service utilities.
- B. Coordinate Work with door opening construction, door frame, and door hardware installation.
- C. Sequence installation to ensure door hardware electric wire connections are achieved in an orderly and expeditious manner.

PART 2 PRODUCTS

2.1 STANDARD HOLLOW METAL DOORS

- A. Manufacturers:
 - 1. Curries Assa Abloy.
 - 2. Allegion Steelcraft.
 - 3. Stiles Steel Door + Window Systems.
 - 4. Substitutions: As specified in Section 012500 - Substitution Procedures.
- B. Product Description:
 - 1. Interior Doors (Non-Rated): SDI-100, 1-3/4 inch thick.
 - a. Level 3 - Extra Heavy Duty, Model 2, seamless design.
 - 2. Interior Doors (Fire Rated): SDI 108, 1-3/4 inch thick.
 - a. Level 3- Extra Heavy Duty, Model 2, seamless design.

2.2 PROVISION FOR HARDWARE

- A. Use hardware templates furnished by hardware manufacturer.
- B. Hardware Reinforcing: Steel, meet or exceed following:
 - 1. Hinges: 10 gauge or 12 gauge channel, full door height, with equivalent threads.
 - 2. Locks: 12 gauge or equivalent number of threads.
 - 3. Surface Closers: 12 gauge by 5-1/4 inch wide U-Channel reinforcement welded to door end channels. Flat reinforcements not accepted.
 - 4. Hold Open Arms: 12 gauge U-Channel.
 - 5. Panic Devices: 14 gauge U-Channels at fastening positions.
 - 6. Floor Check Hinges and Pivots: 7 gauge.
- C. Finish Hardware Locations: Refer to Section 087100 - Door Hardware.

- D. Field Tapping and Drilling: Accepted at surface-applied hardware.

2.3 FABRICATION

- A. Interior Doors: ANSI A250.8/SDI-100, Level 3, Model 2 (Flush Seamless Design). Passing ANSI A250.4 Acceptance Criteria, Level A (1 million cycles).
 - 1. Face Sheets: 16 gauge steel.
 - 2. Core Design: Polystyrene foam core or phenolic impregnated honeycomb paper core, adhesive laminated to both face sheets, except honeycomb core not accepted at doors exposed to moisture.
 - 3. Vertical Edge Reinforcement: One piece, continuously arc welded full length to face sheets.
 - a. Lock Channel: 14 gauge steel, beveled 1/8 inch in 2 inch.
 - b. Hinge Channel: 12 gauge steel, formed and tapered for hinges.
 - 4. Top and Bottom Channel Reinforcement: 16 gauge steel.
- B. Vertical Door Edges: Bevel 1/8 inch in 2 inch at strike side vertical edges and square at hinge side.
- C. Hardware Reinforcement: Fabricate and weld into place. Include concealed stiffeners, reinforcement, edge channels, and moldings fabricated from either cold-rolled or hot-rolled 16 gauge steel.
- D. Exposed Joints: Arc weld continuously, full length. Grind, dress, and make smooth for flush, seamless appearance at edges and joinery.
- E. Welded Construction: Weld door skins to perimeter channels. Glued channels not accepted.

2.4 SHOP FINISHING

- A. Thoroughly clean and chemically treat for maximum adhesion.
- B. Interior Doors: Compatible with finish paint specified in Section 099000 - Painting and Coating.
 - 1. Primer: ANSI/SDI Standard A250.10 factory applied, baked-on rust inhibiting paint. Color: Light gray.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes and tolerances are acceptable.

3.2 INSTALLATION

- A. Install doors in accordance with SDI-100/ANSI A250.8 and DHI.
- B. Coordinate installation of doors with installation of frames specified in Section 081213 and hardware specified in Section 087100 - Door Hardware.

- C. Touch-up factory finished doors.

3.3 SITE QUALITY CONTROL

- A. Upon completion of installation, inspect and test fire rated doors in accordance with NFPA 80.
Inspection and testing shall be performed by inspector certified by the Door and Hardware Institute.

3.4 ERECTION TOLERANCES

- A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.5 ADJUSTING

- A. Adjust door for smooth and balanced door movement.

3.6 SCHEDULE

- A. Refer to Door and Frame Schedule in the drawings.

END OF DOCUMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware
2. Electronic access control system components

B. Section excludes:

1. Windows
2. Cabinets (casework), including locks in cabinets.
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 01 "General Requirements" sections for Allowances, Alternates, Owner Furnished Contractor Installed, Project Management and Coordination.
2. Division 06 Section "Rough Carpentry"
3. Division 06 Section "Finish Carpentry"
4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
5. Division 08 Sections:
 - a. "Metal Doors and Frames"
 - b. "Flush Wood Doors"
 - c. "Stile and Rail Wood Doors"
 - d. "Interior Aluminum Doors and Frames"
 - e. "Aluminum-Framed Entrances and Storefronts"
 - f. "Stainless Steel Doors and Frames"
 - g. "Special Function Doors"
 - h. "Entrances"
6. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
7. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

1.02 REFERENCES

A. UL LLC

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.03 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
 - a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
 - b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:

1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
 - a. Wiring Diagrams: For power, signal, and control wiring and including:
 - 1) Details of interface of electrified door hardware and building safety and security systems.
 - 2) Schematic diagram of systems that interface with electrified door hardware.
 - 3) Point-to-point wiring.
 - 4) Risers.
3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.

- a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
4. Door Hardware Schedule:
 - a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
 - b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
 - c. Indicate complete designations of each item required for each opening, include:
 - 1) Door Index: door number, heading number, and Architect's hardware set number.
 - 2) Quantity, type, style, function, size, and finish of each hardware item.
 - 3) Name and manufacturer of each item.
 - 4) Fastenings and other pertinent information.
 - 5) Location of each hardware set cross-referenced to indications on Drawings.
 - 6) Explanation of all abbreviations, symbols, and codes contained in schedule.
 - 7) Mounting locations for hardware.
 - 8) Door and frame sizes and materials.
 - 9) Degree of door swing and handing.
 - 10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.
5. Key Schedule:
 - a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
 - b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
 - c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
 - d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
 - e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
 - f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.
- C. Informational Submittals:
 1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
 2. Provide Product Data:
 - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
 - b. Include warranties for specified door hardware.
- D. Closeout Submittals:
 1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:

- a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
- b. Catalog pages for each product.
- c. Final approved hardware schedule edited to reflect conditions as installed.
- d. Final keying schedule
- e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
- f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
 - a. Fire door assemblies, in compliance with NFPA 80.
 - b. Required egress door assemblies, in compliance with NFPA 101.

1.04 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
 - a. For door hardware: DHI certified AHC or DHC.
 - b. Can provide installation and technical data to Architect and other related subcontractors.
 - c. Can inspect and verify components are in working order upon completion of installation.
 - d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.
4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:

1. Fire-Rated Door Openings:
 - a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.

- b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
 - 2. Smoke and Draft Control Door Assemblies:
 - a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
 - b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
 - 3. Electrified Door Hardware
 - a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
 - 4. Accessibility Requirements:
 - a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.
- C. Pre-Installation Meetings
- 1. Keying Conference
 - a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
 - 1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - 2) Preliminary key system schematic diagram.
 - 3) Requirements for key control system.
 - 4) Requirements for access control.
 - 5) Address for delivery of keys.
 - 2. Pre-installation Conference
 - a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Inspect and discuss preparatory work performed by other trades.
 - c. Inspect and discuss electrical roughing-in for electrified door hardware.
 - d. Review sequence of operation for each type of electrified door hardware.
 - e. Review required testing, inspecting, and certifying procedures.
 - f. Review questions or concerns related to proper installation and adjustment of door hardware.
 - 3. Electrified Hardware Coordination Conference:
 - a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.

- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
- C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
- D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.06 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1.07 WARRANTY

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.
 - 1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
 - 2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
 - a. Mechanical Warranty
 - 1) Locks
 - a) Schlage L Series: 10 years
 - 2) Exit Devices
 - a) Von Duprin: 10 years
 - 3) Closers
 - a) LCN 4000 Series: 30 years
 - b) LCN Concealed: 15 years
 - 4) Automatic Operators

- a) LCN: 2 years
- b. Electrical Warranty
 - 1) Locks
 - a) Schlage: 3 year
 - 2) Exit Devices
 - a) Von Duprin: 3 year
 - 3) Closers
 - a) LCN: 2 years

1.08 MAINTENANCE

- A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
- B. Turn over unused materials to Owner for maintenance purposes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."
 - 1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.
- B. Approval of alternate manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category are only to be considered by official substitution request in accordance with section 01 25 00.
- C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

- A. Fabrication
 - 1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer's recognized installation standards for application intended.

2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
 3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with "Metal Doors and Frames", "Flush Wood Doors", "Stile and Rail Wood Doors" to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.
- B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.
- C. Cable and Connectors:
1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
 2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.
 3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

2.03 HINGES

- A. Manufacturers and Products:
1. Scheduled Manufacturer and Product:
 - a. Ives 5BB series
 2. Acceptable Manufacturers and Products:
 - a. No Substitute
- B. Requirements:
1. Provide hinges conforming to ANSI/BHMA A156.1.
 2. Provide five knuckle, ball bearing hinges.
 3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
 - a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
 - b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
 4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
 - a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
 5. 2 inches or thicker doors:
 - a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
 6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
 7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.

8. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
 - a. Steel Hinges: Steel pins
 - b. Non-Ferrous Hinges: Stainless steel pins
 - c. Out-Swinging Exterior Doors: Non-removable pins
 - d. Out-Swinging Interior Lockable Doors: Non-removable pins
 - e. Interior Non-lockable Doors: Non-rising pins
9. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

2.04 CONTINUOUS HINGES

A. Manufacturers:

1. Scheduled Manufacturer and Product:
 - a. Ives 700 series
2. Acceptable Manufacturers:
 - a. Markar

B. Requirements:

1. Provide pin and barrel continuous hinges conforming to ANSI/BHMA A156.26., Grade 1.
2. Provide pin and barrel continuous hinges fabricated from 14-gauge, type 304 stainless steel.
3. Provide twin self-lubricated nylon bearings at each hinge knuckle, with 0.25-inch (6 mm) diameter stainless steel pin.
4. Provide hinges capable of supporting door weights up to 600 pounds, and successfully tested for 1,500,000 cycles.
5. On fire-rated doors, provide pin and barrel continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
6. Provide pin and barrel continuous hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.05 CONTINUOUS HINGES

A. Manufacturers:

1. Scheduled Manufacturer and Product:
 - a. Ives 600 series
2. Acceptable Manufacturers:
 - a. Markar

B. Requirements:

1. Provide pin and barrel continuous hinges conforming to ANSI/BHMA A156.26., Grade 1.

2. Provide pin and barrel continuous hinges fabricated from type 1012 cold rolled steel.
3. Provide twin self-lubricated nylon bearings at each hinge knuckle, with 0.25-inch (6 mm) diameter stainless steel pin.
4. Provide hinges capable of supporting door weights up to 600 pounds, and successfully tested for 1,500,000 cycles.
5. On fire-rated doors, provide pin and barrel continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
6. Provide pin and barrel continuous hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.06 ELECTRIC POWER TRANSFER

A. Manufacturers:

1. Scheduled Manufacturer and Product:
 - a. Von Duprin EPT-10
2. Acceptable Manufacturers and Products:
 - a. No Substitute

B. Requirements:

1. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

2.07 PIVOT SETS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. Rixson

B. Requirements:

1. Provide pivot sets complete with oil-impregnated top pivot, unless indicated otherwise.
2. Where offset pivots are specified, Provide one intermediate pivot for doors less than 91 inches (2311 mm) high and one additional intermediate pivot per leaf for each additional 30 inches (762 mm) in height or fraction thereof. Intermediate pivots spaced equally not less than 25 inches (635 mm) or not more than 35 inches (889 mm) on center, for doors over 121 inches (3073 mm) high.
3. Provide appropriate model where pivot sets are scheduled at fire rated openings.

4. Provide pivots with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electrified pivot nearest to electrified locking component. If manufacturer of electrified locking component requires another device for power transfer, then provide recommended power transfer device and appropriate quantity of pivots.
5. Provide mortar guard for each electric pivot specified, unless specified in hollow metal frame specification.

2.08 FLUSH BOLTS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. DCI
 - b. Trimco

B. Requirements:

1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

2.09 COORDINATORS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. Trimco
 - b. DCI

B. Requirements:

1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers, surface vertical rod exit device strikes, or other stop mounted hardware. Factory-prepared coordinators for vertical rod devices as specified.

2.10 MORTISE LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Schlage L9000 series
 2. Acceptable Manufacturers and Products:
 - a. No Substitute
- B. Requirements:
1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3-hour fire doors.
 2. Indicators: Where specified, provide indicator window measuring a minimum 2-3/5-inch x 3/5 inch with 180-degree visibility. Provide messages color-coded using ANSI Z535 Safety Red with full text and/or symbols, as scheduled, for easy visibility. When applicable allows for lock status indication on both sides of the door.
 3. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
 4. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
 5. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1-inch (25 mm) throw, constructed of stainless steel.
 6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide switches and sensors integrated into the locks and latches.
 7. Provide motor based electrified locksets that comply with the following requirements:
 - a. Universal input voltage – single chassis accepts 12 or 24VDC to allow for changes in the field without changing lock chassis.
 - b. Fail Safe/Fail Secure – changing mode between electrically locked (fail safe) and electrically unlocked (fail secure) is field selectable without opening the lock case.
 - c. Low maximum current draw – maximum 0.4 amps to allow for multiple locks on a single power supply.
 - d. Low holding current – maximum 0.01 amps to produce minimal heat, eliminate "hot levers" in electrically locked applications, and to provide reliable operation in wood doors that provide minimal ventilation and air flow.
 - e. Connections – provide quick-connect Molex system standard.
 8. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
 - a. Lever Design: <17A>.

2.11 EXIT DEVICES

- A. Manufacturers and Products:
1. Scheduled Manufacturer and Product:
 - a. Von Duprin 98/35A series
 2. Acceptable Manufacturers and Products:
 - a. No Substitute
- B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide smooth touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide exit devices with weather resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
7. Provide flush end caps for exit devices.
8. Provide exit devices with manufacturer's approved strikes.
9. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
10. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
11. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
12. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
13. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
14. Provide electrified options as scheduled.
15. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
16. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

2.12 ELECTRIC STRIKES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Von Duprin 6000 Series
2. Acceptable Manufacturers and Products:
 - a. No Substitute

B. Requirements:

1. Provide electric strikes designed for use with type of locks shown at each opening.
2. Provide electric strikes UL Listed as burglary resistant that are tested to a minimum endurance test of 1,000,000 cycles.
3. Where required, provide electric strikes UL Listed for fire doors and frames.
4. Provide transformers and rectifiers for each strike as required. Verify voltage with electrical contractor.

2.13 MAGNETIC LOCKS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Schlage
2. Acceptable Manufacturers:
 - a. No Substitute

B. Requirements:

1. Provide magnetic locks certified to meet ANSI/BHMA A156.23 classification criteria, UL10C, and UL1034 for burglary-resistant electronic locking mechanisms.
2. Provide magnetic locks equipped with SPDT Magnetic Bond Sensing device, where specified, to monitor whether enough magnetic holding force exists to ensure adequate locking and SPDT Door Status Monitor device, where specified, to monitor whether door is open or closed. Provide bond sensors fully concealed within electromagnet to resist tampering or damage.
3. Provide fasteners, mounting brackets, and spacer bars required for mounting and details.
4. Provide power supply recommended and approved by manufacturer of magnetic locks.
5. Where magnetic locks are scheduled, provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of magnetic locks for each individual leaf. Switches control both doors simultaneously at pairs. Locate controls as directed by Architect.

2.14 PASSIVE INFRARED MOTION SENSORS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Schlage SCAN II Series
2. Acceptable Manufacturers and Products:
 - a. No Substitute

B. Requirements:

1. Provide motion sensors as specified in hardware groups.

2.15 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer and Product:
 - a. <Best Small Format - Verify Keyway>
2. Acceptable Manufacturers and Products:
 - a. No Substitute

B. Requirements:

1. Provide cylinders/cores to match Owner's existing key system, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.

2.16 KEYING

A. Scheduled System:

1. Existing factory registered system:
 - a. Provide cylinders/cores keyed into Owner's existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Requirements:

1. Construction Keying:
 - a. Replaceable Construction Cores.
 - 1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
 - a) 3 construction control keys
 - b) 12 construction change (day) keys.
 - 2) Owner or Owner's Representative will replace temporary construction cores with permanent cores.
2. Permanent Keying:
 - a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
 - 1) Master Keying system as directed by the Owner.
 - b. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
 - c. Provide keys with the following features:
 - 1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
 - 2) Patent Protection: Keys and blanks protected by one or more utility patent(s).
 - d. Identification:
 - 1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
 - 2) Identification stamping provisions must be approved by the Architect and Owner.
 - 3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
 - 4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
 - 5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
 - e. Quantity: Furnish in the following quantities.
 - 1) Permanent Control Keys: 3.
 - 2) Master Keys: 6.
 - 3) Change (Day) Keys: 3 per cylinder/core that is keyed differently.
 - 4) Key Blanks: Quantity as determined in the keying meeting.

2.17 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. LCN 4040XP series
2. Acceptable Manufacturers and Products:
 - a. No Substitute
 - b. Corbin-Russwin DC8000 series
 - c. Sargent 281 series

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2-inch (38 mm) diameter piston with 5/8-inch (16 mm) diameter double heat-treated pinion journal. QR code with a direct link to maintenance instructions.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. Provide snap-on cover clip, with plastic covers, which secures cover to spring tube.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck. Provide graphically labelled instructions on the closer body adjacent to each adjustment valve. Provide positive stop on reg valve that prevents reg screw from being backed out.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.18 ELECTRO-MECHANICAL CLOSER/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. LCN
2. Acceptable Manufacturers:
 - a. Rixson

B. Requirements:

1. Provide single-point or multi-point hold-open electro-mechanical closer/holders as specified. Coordinate voltage requirements and provide transformer if necessary.
2. Provide closer/holders that function as full rack and pinion door closer when current is interrupted or continuous hold-open is not engaged.
3. Provide door closers with fully hydraulic, full rack and pinion action with high strength cylinder and full complement bearings at shaft.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.19 ELECTRO-HYDRAULIC AUTOMATIC OPERATORS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. LCN 4600 series
2. Acceptable Manufacturers and Products:
 - a. Besam Power Swing

B. Requirements:

1. Provide low energy automatic operator units with hydraulic closer complying with ANSI/BHMA A156.19.
2. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
3. Provide units with conventional door closer opening and closing forces unless power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check, and opening and closing speed adjustment valves to control door.
4. Provide units with on/off switch for manual operation, motor start up delay, vestibule interface delay, electric lock delay, and door hold open delay.
5. Provide drop plates, brackets, and adapters for arms as required for details.
6. Provide actuator switches and receivers for operation as specified.
7. Provide weather-resistant actuators at exterior applications.
8. Provide key switches with LED's, recommended and approved by manufacturer of automatic operator as required for function described in operation description of hardware group below. Cylinders: Refer to "KEYING" article, herein.
9. Provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf. Actuators control both doors simultaneously at pairs. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings as directed by Architect. Locate actuators, key switches, and other controls as directed by Architect.
10. Provide units with vestibule inputs that allow sequencing operation of two units, and SPDT relay for interfacing with latching or locking devices.

2.20 ELECTRO-MECHANICAL AUTOMATIC OPERATORS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. LCN Senior Swing
2. Acceptable Manufacturers and Products:
 - a. Besam Swingmaster MP

B. Requirements:

1. Provide low energy automatic operator units that are electro-mechanical design complying with ANSI/BHMA A156.19.
 - a. Opening: Powered by DC motor working through reduction gears.
 - b. Closing: Spring force.
 - c. Manual, hydraulic, or chain drive closers: Not permitted.
 - d. Operation: Motor is off when door is in closing mode. Door can be manually operated with power on or off without damage to operator. Provide variable adjustments, including opening and closing speed adjustment.
 - e. Cover: Aluminum.
2. Provide units with manual off/auto/hold-open switch, push and go function to activate power operator, vestibule interface delay, electric lock delay, hold-open delay adjustable from 1 to 32 seconds, and logic terminal to interface with accessories, mats, and sensors.
3. Provide drop plates, brackets, and adapters for arms as required to suit details.
4. Provide motion sensors and/or actuator switches, and receivers for operation as specified. Provide weather-resistant actuators at exterior applications.
5. Provide key switches, with LED's, recommended and approved by manufacturer of automatic operator as required for function as described in operation description of hardware sets. Cylinders: Refer to "KEYING" article, herein.
6. Provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf. Actuators control both doors simultaneously at pairs. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings as directed by Architect. Locate actuators, key switches, and other controls as directed by Architect.

2.21 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. Burns
 - b. Trimco

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.

2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

2.22 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers:
 - a. Glynn-Johnson
2. Acceptable Manufacturers:
 - a. Rixson

B. Requirements:

1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.

2.23 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. Burns
 - b. Trimco

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button or thumbturn.
2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other, and overhead stop cannot be used.

2.24 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Zero International
2. Acceptable Manufacturers:
 - a. National Guard
 - b. Reese
 - c. Pemko

B. Requirements:

1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

2.25 MAGNETIC HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. LCN
2. Acceptable Manufacturers:
 - a. Rixson

B. Requirements:

1. Provide wall or floor mounted electromagnetic door release as specified with minimum of 25 pounds of holding force. Coordinate projection of holder and armature with other hardware and wall conditions to ensure that door sits parallel to wall when fully open. Connect magnetic holders on fire-rated doors into the fire control panel for fail-safe operation.

2.26 FINISHES

A. FINISH: BHMA 625/651 (US26); EXCEPT:

1. Hinges at Exterior Doors: BHMA 629 (US32)
2. Push Plates, Pulls, and Push Bars: BHMA 629 (US32)
3. Protection Plates: BHMA 629 (US32)
4. Overhead Stops and Holders: BHMA 629 (US32)
5. Door Closers: Powder Coat to Match
6. Wall Stops: BHMA 629 (US32)
7. Latch Protectors: BHMA 630 (US32D)
8. Weatherstripping: Clear Anodized Aluminum
9. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 - 2. Custom Steel Doors and Frames: HMMA 831.
 - 3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
 - 4. Installation Guide for Doors and Hardware: DHI TDH-007-20
- B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.
- C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.
- I. Lock Cylinders:
 - 1. Install construction cores to secure building and areas during construction period.
 - 2. Replace construction cores with permanent cores as indicated in keying section.
 - 3. Furnish permanent cores to Owner for installation.
- J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:

1. Conduit, junction boxes and wire pulls.
 2. Connections to and from power supplies to electrified hardware.
 3. Connections to fire/smoke alarm system and smoke evacuation system.
 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
 5. Connections to panel interface modules, controllers, and gateways.
 6. Testing and labeling wires with Architect's opening number.
- K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- L. Continuous Hinges: Re-locate the door and frame fire rating labels where they will remain visible so that the hinge does not cover the label once installed.
- M. Door Closers & Auto Operators: Mount closers/operators on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers/operators so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
- N. Overhead Stops/Holders: Mount overhead stops/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- O. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
- P. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- Q. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
- R. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- S. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- T. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

3.03 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
1. Spring Hinges: Adjust to achieve positive latching when door can close freely from an open position of 30 degrees.
 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

- B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.04 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items per manufacturer's instructions to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.05 DOOR HARDWARE SCHEDULE

- A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.
- B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.
- C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.
- D. Hardware Sets:

Hardware Group No. 01

For use on Door #(s):

251A	251B	252A	252B	253A	253B
254A	254B	255A	255B	256A	256B
3511	B110A	B111A	B112A	B113A	B113B
B114A	B114B	B115A	B115B	B116A	B116B
B117A	B118A	B119A	D133A	D134A	D135A
D136A	D137A	D138A	D139A	D140A	E141A
E142A	E143A	E144A	E145A	E146A	E147A
E148A	F149A	F150A	F151A	F152A	

Provide each PR door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA INTERMEDIATE PIVOT	7226F PT_INT TW8 CON_Y	630	IVE
1	EA ELEC FIRE EXIT HARDWARE	RX-QEL-9847-L-DT-F-17-CON 24 VDC	626	VON
1	EA ELEC FIRE EXIT HARDWARE	RX-QEL-9947-L-NL-F-17-CON 24 VDC	626	VON
1	EA RIM CYLINDER	REUSE EXISTING CYLINDER	626	BES
1	EA GASKETING	488SBK PSA	BK	ZER
		ACCESS CONTROL - WORK OF DIVISION 28		
		DOOR CONTACT(S) - WORK OF DIV. 28		
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME		
		POWER SUPPLY - WORK OF DIVISION 28		
		REMAINDER OF HARDWARE EXISTING		







PATCH, PLUG AND REPAIR FRAME AS REQUIRED.

Hardware Group No. 02

For use on Door #(s):

251C 256C 258

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	ARMORED DOOR CORD	K-DL38A		689	KEE
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-DT-17-CON 24 VDC	 ⚡	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-NL-17-CON 24 VDC	 ⚡	626	VON
1	EA	RIM CYLINDER	REUSE EXISTING CYLINDER		626	BES
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER
2	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	⚡		SCH
2	EA	WIRE HARNESS	CON-6W	⚡		SCH
			ACCESS CONTROL - WORK OF DIVISION 28	⚡		
			DOOR CONTACT(S) - WORK OF DIV. 28	⚡		
			COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28	⚡		
			REMAINDER OF HARDWARE EXISTING			








PATCH, PLUG AND REPAIR FRAME AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS AND ADJUST AS REQUIRED PRIOR TO ORDERING. REUSE EXISTING CYLINDER. REPLACE DOORS AS REQUIRED.

Hardware Group No. 03

For use on Door #(s):

257 XC00H

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	ARMORED DOOR CORD	K-DL38A		689	KEE
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-DT-17-CON 24 VDC	 ⚡	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-NL-17-CON 24 VDC	 ⚡	626	VON
1	EA	RIM CYLINDER	REUSE EXISTING CYLINDER		626	BES
2	EA	SURFACE CLOSER	4040XP EDA WMS		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER
2	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	⚡		SCH
2	EA	WIRE HARNESS	CON-6W	⚡		SCH
			ACCESS CONTROL - WORK OF DIVISION 28	⚡		
			DOOR CONTACT(S) - WORK OF DIV. 28	⚡		
			COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28	⚡		
			REMAINDER OF HARDWARE EXISTING			




PATCH, PLUG AND REPAIR FRAME AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS AND ADJUST AS REQUIRED PRIOR TO ORDERING. REUSE EXISTING CYLINDER. REPLACE DOORS AS REQUIRED.

Hardware Group No. 04

For use on Door #(s):

1106 1200C

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 CON TW8	 ✓	652	IVE
1	EA	EU MORTISE LOCK	L9092BDEU 17A RX CON 12/24 VDC	 ✓	626	SCH
1	EA	SURFACE CLOSER	4040XP REG WMS		689	LCN
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓		SCH
1	EA	WIRE HARNESS	CON-6W	✓		SCH
		ACCESS CONTROL - WORK OF DIVISION 28		✓		
		DOOR CONTACT(S) - WORK OF DIV. 28		✓		
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✓		
		REMAINDER OF HARDWARE EXISTING				




VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. ADJUST AS REQUIRED. PATCH PLUG AND REPAIR DOOR AS REQUIRED.

Hardware Group No. 05

For use on Door #(s):

1110 1199 1200A 1200B 1201

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 CON TW8	 ✓	652	IVE
1	EA	EU MORTISE LOCK	L9092BDEU 17A RX CON 12/24 VDC	 ✓	626	SCH
2	EA	SURFACE CLOSER	4040XP REG WMS		689	LCN
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓		SCH
1	EA	WIRE HARNESS	CON-6W	✓		SCH
		ACCESS CONTROL - WORK OF DIVISION 28		✓		
		DOOR CONTACT(S) - WORK OF DIV. 28		✓		
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✓		
		REMAINDER OF HARDWARE EXISTING				




VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. ADJUST AS REQUIRED. PATCH, PLUG AND REPAIR DOOR AS REQUIRED.

Hardware Group No. 06

For use on Door #(s):

1113 3026

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 CON TW8	 ✓	652	IVE
1	EA	EU MORTISE LOCK	L9092BDEU 17A RX CON 12/24 VDC	 ✓	626	SCH
1	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC	 ✓	689	LCN
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓		SCH
1	EA	WIRE HARNESS	CON-6W	✓		SCH
		ACCESS CONTROL - WORK OF DIVISION 28		✓		
		DOOR CONTACT(S) - WORK OF DIV. 28		✓		
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✓		
		REMAINDER OF HARDWARE EXISTING				


VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. ADJUST AS REQUIRED. PATCH PLUG AND REPAIR DOOR AS REQUIRED. VERIFY HOLDER TYPE REQUIRED PRIOR TO ORDERING.

Hardware Group No. 07

For use on Door #(s):

1129

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC	 ✓	689	LCN
		REMAINDER OF HARDWARE EXISTING				

Hardware Group No. 08

For use on Door #(s):

1136 1142A 1151

Provide each PR door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA ELECTRIC HINGE	5BB1HW 4.5 X 4.5 CON TW8	✓ 652	IVE
1	EA EU MORTISE LOCK	L9092BDEU 17A RX CON 12/24 VDC	✓ 626	SCH
2	EA SURFACE CLOSER	4040XP EDA WMS	689	LCN
2	EA ARMOR PLATE	8402 48" X 1" LDW B-CS	630	IVE
1	EA WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓	SCH
1	EA WIRE HARNESS	CON-6W	✓	SCH
		ACCESS CONTROL - WORK OF DIVISION 28	✓	
		DOOR CONTACT(S) - WORK OF DIV. 28	✓	
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME		
		POWER SUPPLY - WORK OF DIVISION 28	✓	
		REMAINDER OF HARDWARE EXISTING		




VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. ADJUST AS REQUIRED. CUT HOLES FOR HARDWARE IN ARMOR PLATE AS REQUIRED. PATCH PLUG AND REPAIR DOOR AS REQUIRED. DOORS MAY NEED REPLACING.

Hardware Group No. 09

For use on Door #(s):

1161 1161A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 CON TW8	 ✓	652	IVE
1	EA	EU MORTISE LOCK	L9092BDEU 17A RX CON 12/24 VDC	 ✓	626	SCH
2	EA	SURFACE CLOSER	4040XP REG WMS		689	LCN
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓		SCH
1	EA	WIRE HARNESS	CON-6W	✓		SCH
		ACCESS CONTROL - WORK OF DIVISION 28		✓		
		DOOR CONTACT(S) - WORK OF DIV. 28		✓		
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✓		
		REMAINDER OF HARDWARE EXISTING				




VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. ADJUST AS REQUIRED. PATCH, PLUG AND REPAIR DOOR AS REQUIRED.

Hardware Group No. 10

For use on Door #(s):

1166

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 CON TW8	 ✓	652	IVE
1	EA	EU MORTISE LOCK	L9092BDEU 17A RX CON 12/24 VDC	 ✓	626	SCH
2	EA	SURFACE CLOSER	4040XP REG WMS		689	LCN
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓		SCH
1	EA	WIRE HARNESS	CON-6W	✓		SCH
		ACCESS CONTROL - WORK OF DIVISION 28		✓		
		DOOR CONTACT(S) - WORK OF DIV. 28		✓		
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✓		
		REMAINDER OF HARDWARE EXISTING				

VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. ADJUST AS REQUIRED. PATCH, PLUG AND REPAIR DOOR AS REQUIRED. REPLACE ASA STRIKE.

Hardware Group No. 11

For use on Door #(s):

1168	1175	1836B	1871A	1871B	3005A
3005B	3088	3090A	3090B	3091	3092
3094	3514	3531A	3545	A101	A102
C127	C128	S0901	S1201	S1601	

Provide each SGL door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 CON TW8	IVE
1	EA	EU MORTISE LOCK	L9092BDEU 17A RX CON 12/24 VDC	SCH
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	SCH
1	EA	WIRE HARNESS	CON-6W	SCH
		ACCESS CONTROL - WORK OF DIVISION 28		
		DOOR CONTACT(S) - WORK OF DIV. 28		
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME		
		POWER SUPPLY - WORK OF DIVISION 28		
		REMAINDER OF HARDWARE EXISTING		

VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. ADJUST AS REQUIRED. PATCH PLUG AND REPAIR DOOR AS REQUIRED. ADD 689 CLOSER COVER AND REPAINT ARMS AS REQUIRED.

Hardware Group No. 12

For use on Door #(s):
 1181

Provide each SGL door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA ELECTRIC HINGE	5BB1HW 4.5 X 4.5 CON TW8	✓ 652	IVE
1	EA EU MORTISE LOCK	L9092BDEU 17A RX CON 12/24 VDC	✓ 626	SCH
1	EA MAGNET	SEM7850 12V/24V/120V	689	LCN
1	EA WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓	SCH
1	EA WIRE HARNESS	CON-6W	✓	SCH
		ACCESS CONTROL - WORK OF DIVISION 28	✓	
		DOOR CONTACT(S) - WORK OF DIV. 28	✓	
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME		
		POWER SUPPLY - WORK OF DIVISION 28	✓	
		REMAINDER OF HARDWARE EXISTING		






VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. ADJUST AS REQUIRED. PATCH PLUG AND REPAIR DOOR AS REQUIRED. ADD CLOSER COVER AS REQUIRED. DO NOT RECOMMEND MAGNETIC HOLDER AT ELECTRICAL ROOMS DUE TO LIABILITY REASONS,

Hardware Group No. 13

For use on Door #(s):

1191A 1191B 1191C

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 CON TW8	 ✓	652	IVE
2	EA	ARMORED DOOR CORD	K-DL38A		689	KEE
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9827-L-DT-F-LBRAFL- 17-499F-CON 24 VDC	 ✓	626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9827-L-NL-F-LBR-17- 499F-CON 24 VDC	 ✓	626	VON
2	EA	ARMOR PLATE	8402 34" X 1" LDW B-CS		630	IVE
2	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓		SCH
2	EA	WIRE HARNESS	CON-6W	✓		SCH
			ACCESS CONTROL - WORK OF DIVISION 28	✓		
			DOOR CONTACT(S) - WORK OF DIV. 28	✓		
			COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28	✓		
			REMAINDER OF HARDWARE EXISTING			

PATCH PLUG AND REPAIR DOORS AS REQUIRED. USE 5BB1HW X TW8 TRANSFER HINGES IF POSSIBLE OVER THE USE OF K-DL38A

Hardware Group No. 14

For use on Door #(s):

1516 1832A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8		✓ 652	IVE
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-DT-17-CON 24 VDC		✓ 626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-L-NL-F-17 24 VDC		✓ 626	VON
1	EA	SURF. AUTO OPERATOR	9553 REG/STD STD72 MS AS REQ (120/240 VAC)		✓ ANCL R	LCN
2	EA	ACTUATOR, TOUCH	8310-856T		✓ 630	LCN
2	EA	MOUNT BOX	8310-868S			LCN
2	EA	ARMOR PLATE	8402 34" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
2	EA	MEETING ASTRAGAL	8193AA		AA	ZER
			(ONE SET)			
			ACCESS CONTROL - WORK OF DIVISION 28	✓		
			DOOR CONTACT(S) - WORK OF DIV. 28	✓		
			COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28	✓		
			REMAINDER OF HARDWARE EXISTING			








PATCH, PLUG AND REPAIR FRAME AS REQUIRED. REPLACE DOORS AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING.

Hardware Group No. 15

For use on Door #(s):

1550 1570

Provide each PR door(s) with the following:

QTY	EA	DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8		✓ 652	IVE
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-DT-17-CON 24 VDC		✓ 626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-NL-17 24 VDC		✓ 626	VON
2	EA	SURFACE CLOSER	4040XP EDA WMS		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
2	EA	MEETING ASTRAGAL	8193AA		AA	ZER
		(ONE SET)				
		ACCESS CONTROL - WORK OF		✓		
		DIVISION 28				
		DOOR CONTACT(S) - WORK OF		✓		
		DIV. 28				
		COORDINATE WITH SECURITY-				
		PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF		✓		
		DIVISION 28				
		REMAINDER OF HARDWARE				
		EXISTING				





PATCH, PLUG AND REPAIR FRAME AS REQUIRED. REPLACE DOORS AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING.

Hardware Group No. 16

For use on Door #(s):

1580 1590 1862 1863 3503 3507

Provide each SGL door(s) with the following:










QTY	EA	DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	EU MORTISE LOCK	L9492BDEU 17A 626 625 L583-363 RX LX DM CON 12/24 VDC	 ✓	626	SCH
1	EA	ELECTRIC STRIKE	6400 FSE 12/24 VAC/VDC	 ✓	630	VON
2	EA	ACTUATOR, TOUCH	8310-856T	 ✓	630	LCN
2	EA	MOUNT BOX	8310-868S			LCN
1	EA	WIRE HARNESS	CON-6W	✓		SCH
		ACCESS CONTROL - WORK OF DIVISION 28		✓		
		DOOR CONTACT(S) - WORK OF DIV. 28		✓		
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✓		
		REMAINDER OF HARDWARE EXISTING				

PATCH PLUG AND REPAIR DOOR AND FRAME AS REQUIRED. FRAME WILL NEED TO BE REPLACED OR THE EXISTING FRAME WILL NEED TO BE RE-LABELED / CERTIFIED DUE TO THE NEW ELECTRIC STRIKE NEEDING TO BE ADDED. REUSE EXISTING AUTO OPERATOR.

Hardware Group No. 17

For use on Door #(s):
1650

Provide each PR door(s) with the following:












QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	ARMORED DOOR CORD	K-DL38A		689	KEE
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-DT-17-CON 24 VDC	 ✎	626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-L-NL-F-17 24 VDC	 ✎	626	VON
1	EA	SURF. AUTO OPERATOR	9553 REG/STD STD72 MS AS REQ (120/240 VAC)	 ✎	ANCL R	LCN
2	EA	ACTUATOR, TOUCH	8310-856T	 ✎	630	LCN
2	EA	MOUNT BOX	8310-868S			LCN
2	EA	ARMOR PLATE	8402 34" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
2	EA	MEETING ASTRAGAL	8193AA		AA	ZER
			(ONE SET)			
			ACCESS CONTROL - WORK OF DIVISION 28	✎		
			DOOR CONTACT(S) - WORK OF DIV. 28	✎		
			COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28	✎		
			REMAINDER OF HARDWARE EXISTING			

PATCH, PLUG AND REPAIR FRAME AS REQUIRED. REPLACE DOORS AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING.

Hardware Group No. 18

For use on Door #(s):
 1832B

Provide each PR door(s) with the following:







QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	705		630	IVE
1	EA	CONT. HINGE	705 EPT		630	IVE
1	EA	POWER TRANSFER	EPT10 CON	 ⚡	689	VON
1	EA	AUTO FLUSH BOLT	FB31T		630	IVE
1	EA	EU MORTISE LOCK	L9092BDEU 17A RX CON 12/24 VDC	 ⚡	626	SCH
1	EA	COORDINATOR	COR X FL		628	IVE
2	EA	SURFACE CLOSER	4040XP REG WMS		689	LCN
2	EA	ARMOR PLATE	8402 34" X 1" LDW B-CS		630	IVE
2	EA	MAGNET	SEM7850 12V/24V/120V		689	LCN
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	ASTRAGAL	383AA		AA	ZER
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	⚡		SCH
1	EA	WIRE HARNESS	CON-6W	⚡		SCH
		ACCESS CONTROL - WORK OF DIVISION 28		⚡		
		DOOR CONTACT(S) - WORK OF DIV. 28		⚡		
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		⚡		
		REMAINDER OF HARDWARE EXISTING				

VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. ADJUST AS REQUIRED. CUT HOLES FOR HARDWARE IN ARMOR PLATE AS REQUIRED. PATCH PLUG AND REPAIR DOOR AS REQUIRED. DOORS MAY NEED REPLACING.

Hardware Group No. 19

For use on Door #(s):
 1840

Provide each SGL door(s) with the following:










QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	ARMORED DOOR CORD	K-DL38A		689	KEE
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9875-L-NL-F-17-CON 24 VDC	 ✎	626	VON
1	EA	MORTISE CYLINDER	REUSE EXISTING CYLINDER		626	BES
1	EA	OH STOP	90S J		630	GLY
1	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC	 ✎	689	LCN
21	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✎		SCH
1	EA	WIRE HARNESS	CON-6W	✎		SCH
		ACCESS CONTROL - WORK OF DIVISION 28		✎		
		DOOR CONTACT(S) - WORK OF DIV. 28		✎		
		COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✎		
		REMAINDER OF HARDWARE EXISTING				

PATCH, PLUG AND REPAIR FRAME AS REQUIRED. VTRACK HOLDER CLOSER TO BE MOUNTED
 PUSH SIDE. SURFACE OVERHEAD STOP TO BE MOUNTED PULL SIDE. TEMPLATE AS REQUIRED
 FOR PROPER HOLDING AND STOPPING. REUSE EXISTING CYLINDER.

Hardware Group No. 20

For use on Door #(s):
 1844

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8		✓ 652	IVE
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-DT-17-CON 24 VDC		✓ 626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-L-NL-F-17-CON 24 VDC		✓ 626	VON
1	EA	RIM CYLINDER	REUSE EXISTING CYLINDER		626	BES
2	EA	OH STOP	90S J		630	GLY
2	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC		✓ 689	LCN
2	EA	ARMOR PLATE	8402 34" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER
			ACCESS CONTROL - WORK OF DIVISION 28	✓		
			DOOR CONTACT(S) - WORK OF DIV. 28	✓		
			COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28	✓		










PATCH, PLUG AND REPAIR DOORS AS REQUIRED. REPLACE DOORS. VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING.

Hardware Group No. 21

For use on Door #(s):

1849A 1849B 1849C

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8		✓ 652	IVE
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-DT-17-CON 24 VDC		✓ 626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-L-NL-F-17-CON 24 VDC		✓ 626	VON
1	EA	RIM CYLINDER	REUSE EXISTING CYLINDER		626	BES
2	EA	OH STOP	90S J		630	GLY
2	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC		✓ 689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER
			ACCESS CONTROL - WORK OF DIVISION 28	✓		
			DOOR CONTACT(S) - WORK OF DIV. 28	✓		
			COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28	✓		









PATCH, PLUG AND REPAIR DOORS AS REQUIRED. REPLACE DOORS IF NOT REPAIRABLE OR WILL NOT HOLD LABELING FROM PANIC DEVICE CHANGES. VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. CUT ARMOR PLATE FOR HARDWARE AS REQUIRED.

Hardware Group No. 22

For use on Door #(s):

1851A 1851B

Provide each PR door(s) with the following:










QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
8	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
1	EA	FIRE EXIT HARDWARE	9849-L-DT-F-06		626	VON
1	EA	FIRE EXIT HARDWARE	9849-L-DT-F-06-LBLAFL		626	VON
2	EA	OH STOP	90S J		630	GLY
2	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC		✓ 689	LCN
2	EA	ARMOR PLATE	8402 48" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER

PATCH, PLUG AND REPAIR DOORS AS REQUIRED. REPLACE DOORS IF NOT REPAIRABLE OR WILL NOT HOLD LABELING FROM PANIC DEVICE CHANGES.

Hardware Group No. 23

For use on Door #(s):
1851C

Provide each PR door(s) with the following:






QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8		✓ 652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9847-L-DT-F-17-CON 24 VDC		✓ 626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-L-NL-F-17-CON 24 VDC		✓ 626	VON
1	EA	RIM CYLINDER	REUSE EXISTING CYLINDER		626	BES
2	EA	OH STOP	90S J		630	GLY
2	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC		✓ 689	LCN
2	EA	ARMOR PLATE	8402 48" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER
			ACCESS CONTROL - WORK OF DIVISION 28		✓	
			DOOR CONTACT(S) - WORK OF DIV. 28		✓	
			COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28		✓	

PATCH, PLUG AND REPAIR DOORS AS REQUIRED. REPLACE DOORS IF NOT REPAIRABLE OR WILL NOT HOLD LABELING FROM PANIC DEVICE CHANGES. VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. CUT ARMOR PLATE FOR HARDWARE AS REQUIRED.

Hardware Group No. 24

For use on Door #(s):
1864

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	FIRE EXIT HARDWARE	9849-L-BE-F-17		626	VON
1	EA	FIRE EXIT HARDWARE	9849-L-BE-F-17-LBLAFL		626	VON
2	EA	MAGNET	SEM7850 12V/24V/120V		689	LCN
1	EA	GASKETING	488SBK PSA		BK	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER
			DOOR CONTACT(S) - WORK OF DIV. 28		✓	
			COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME			

PATCH, PLUG AND REPAIR DOORS AND FRAME AS REQUIRED.

Hardware Group No. 25

For use on Door #(s):

1867B 3909

Provide each SGL door(s) with the following:





QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	ELECTRIC STRIKE	6400 FSE 12/24 VAC/VDC	VON
1	EA	SURF. AUTO OPERATOR	4642 TBWMS	LCN
2	EA	ACTUATOR, TOUCH	8310-856T	LCN
2	EA	MOUNT BOX	8310-868S	LCN
1	EA	WIRE HARNESS	CON-6W	SCH
		ACCESS CONTROL - WORK OF		
		DIVISION 28		
		DOOR CONTACT(S) - WORK OF		
		DIV. 28		
		COORDINATE WITH SECURITY-		
		PREP DOOR(S) AND FRAME		
		POWER SUPPLY - WORK OF		
		DIVISION 28		
		REMAINDER OF HARDWARE		
		EXISTING		

PATCH PLUG AND REPAIR DOOR AND FRAME AS REQUIRED. FRAME WILL NEED TO BE REPLACED OR THE EXISTING FRAME WILL NEED TO BE RE-LABELED / CERTIFIED DUE TO THE NEW ELECTRIC STRIKE NEEDING TO BE ADDED.

Hardware Group No. 26

For use on Door #(s):
1868

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 CON TW8	 ✓	652	IVE
1	EA	EU MORTISE LOCK	L9092BDEU 17A RX CON 12/24 VDC	 ✓	626	SCH
1	EA	OH STOP	90S		630	GLY
1	EA	SURFACE CLOSER	4040XP REG WMS		689	LCN
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓		SCH
1	EA	WIRE HARNESS	CON-6W	✓		SCH
		ACCESS CONTROL - WORK OF DIVISION 28		✓		
		DOOR CONTACT(S) - WORK OF DIV. 28		✓		
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✓		
		REMAINDER OF HARDWARE EXISTING				








VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. ADJUST AS REQUIRED. PATCH PLUG AND REPAIR DOOR AS REQUIRED.

Hardware Group No. 27

For use on Door #(s):

3000A G131A G132A

Provide each PR door(s) with the following:









QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8	 ✓	652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-9849-EO-F-CON	 ✓	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-NL-17 24 VDC	 ✓	626	VON
2	EA	FIRE/LIFE HOLDER	4040SEH SEH AC/DC	 ✓	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	 ✓	630	IVE
1	EA	GASKETING	488SBK PSA	 ✓	BK	ZER
2	EA	MEETING ASTRAGAL	8193AA	 ✓	AA	ZER
		(ONE SET)				
		ACCESS CONTROL - WORK OF		✓		
		DIVISION 28				
		DOOR CONTACT(S) - WORK OF		✓		
		DIV. 28				
		COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF		✓		
		DIVISION 28				
		REMAINDER OF HARDWARE EXISTING				

PATCH, PLUG AND REPAIR FRAME AS REQUIRED. REPLACE DOORS AS REQUIRED.

Hardware Group No. 28

For use on Door #(s):
 3000B

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8	 ✓	652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-9849-L-DT-F-17-LBLAFL- CON	 ✓	626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-L-NL-F-17-CON 24 VDC	 ✓	626	VON
1	EA	RIM CYLINDER	REUSE EXISTING CYLINDER		626	BES
2	EA	FIRE/LIFE HOLDER	4040SEH SEH AC/DC	 ✓	689	LCN
2	EA	SURFACE CLOSER	4040XP SCUSH WMS	 ✓	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	 ✓	630	IVE
1	EA	GASKETING	488SBK PSA	 ✓	BK	ZER
2	EA	MEETING ASTRAGAL	8193AA (ONE SET)	 ✓	AA	ZER
2	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓		SCH
2	EA	WIRE HARNESS	CON-6W	✓		SCH
			ACCESS CONTROL - WORK OF DIVISION 28	✓		
			DOOR CONTACT(S) - WORK OF DIV. 28	✓		
			COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28	✓		
			REMAINDER OF HARDWARE EXISTING			

PATCH, PLUG AND REPAIR FRAME AS REQUIRED. REPLACE DOORS AS REQUIRED. VERIFY
 HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING

Hardware Group No. 29

For use on Door #(s):

3016A 3016G

Provide each PR door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA FIRE/LIFE HOLDER	4040SEH SEH AC/DC	689	LCN
2	EA SURFACE CLOSER	4040XP SCUSH WMS	689	LCN
2	EA ARMOR PLATE	8402 48" X 1" LDW B-CS	630	IVE
		ACCESS CONTROL - WORK OF DIVISION 28		
		DOOR CONTACT(S) - WORK OF DIV. 28		
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME		
		POWER SUPPLY - WORK OF DIVISION 28		
		REMAINDER OF HARDWARE EXISTING		

COORDINATE HARDWARE PREPS IN ARMOR PLATES AS REQUIRED. ACCESS CONTROL EXISTING. COORDINATE / TEMPLATE TRACK HOLDERS AND SCUSH CLOSERS.

Hardware Group No. 30

For use on Door #(s):

3016B 3016C 3016D 3016E 3016F 3016H

Provide each PR door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA FIRE/LIFE HOLDER	4040SEH SEH AC/DC	689	LCN
2	EA SURFACE CLOSER	4040XP SCUSH WMS	689	LCN
2	EA ARMOR PLATE	8402 48" X 1" LDW B-CS	630	IVE
		REMAINDER OF HARDWARE EXISTING		

COORDINATE HARDWARE PREPS IN ARMOR PLATES AS REQUIRED.

Hardware Group No. 31

For use on Door #(s):
 3034A

Provide each SGL door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	MAGNETIC LOCK	M490P ATS/LED 12/24 VDC	✓ 628	SCE
1	EA	PUSH BUTTON	621GREX DA 12/24 VDC	✓ 630	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	✓ WHT	SCE
		ACCESS CONTROL - WORK OF DIVISION 28	✓		
		DOOR CONTACT(S) - WORK OF DIV. 28	✓		
		COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME			
		POWER SUPPLY - WORK OF DIVISION 28	✓		











INTERCOM BY DIV 028

Hardware Group No. 32

For use on Door #(s):

3537 3547

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8		✓ 652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-EO-F-CON 24 VDC		✓ 626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-L-NL-F-17 24 VDC		✓ 626	VON
1	EA	SURF. AUTO OPERATOR	9553 REG/STD STD72 MS AS REQ (120/240 VAC)		✓ ANCL R	LCN
2	EA	ACTUATOR, TOUCH	8310-856T		✓ 630	LCN
2	EA	MOUNT BOX	8310-868S			LCN
2	EA	ARMOR PLATE	8402 34" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
2	EA	MEETING ASTRAGAL	8193AA (ONE SET)		AA	ZER
			ACCESS CONTROL - WORK OF DIVISION 28	✓		
			DOOR CONTACT(S) - WORK OF DIV. 28	✓		
			COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28	✓		
			REMAINDER OF HARDWARE EXISTING			

PATCH, PLUG AND REPAIR FRAME AS REQUIRED. REPLACE DOORS AS REQUIRED. VERIFY
HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING.

Hardware Group No. 33

For use on Door #(s):

3900A 3900B

Provide each PR door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
		ACCESS CONTROL - WORK OF DIVISION 28	✓	
		DOOR CONTACT(S) - WORK OF DIV. 28	✓	
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME		
		POWER SUPPLY - WORK OF DIVISION 28	✓	
1		REMAINDER OF HARDWARE EXISTING		

VERIFY IF EXTERIOR EMERGENCY CALL STATION / BOX TO BE INSTALLED BY CODE. OPENINGS COULD BE EASILY MISTAKEN FOR AN EXIT.

Hardware Group No. 34

For use on Door #(s):

3910 3920

Provide each SGL door(s) with the following:










QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA ELECTRIC HINGE	5BB1HW 4.5 X 4.5 CON TW8	✓ 652	IVE
1	EA PASSAGE SET	L9010 17A LESS LOCK CASE 625	626	SCH
1	EA ELECTRIC RETRACTION MORTISE LOCK CASE-	Z7835- LESS TRIM	✓ 626	SDC
2	EA ACTUATOR, TOUCH	8310-856T	✓ 630	LCN
2	EA MOUNT BOX	8310-868S		LCN
1	EA GASKETING	488SBK PSA	BK	ZER
		REMAINDER OF HARDWARE EXISTING		

PATCH PLUG AND REPAIR FRAME AS REQUIRED. REPLACE HM DOOR AS FIRE LABELING HAS BEEN VOIDED WITH ALL OF OWNER MODIFICATIONS. VERIFY ACTUATOR TYPE REQUIRED. REUSE EXISTING AUTO OPERATOR. REPLACE STRIKE IN FRAME AND PLUG DEADBOLT STRIKE HOLE. VERIFY HINGE THICKNESS AND HEIGHT REQUIRED PRIOR TO ORDERING. ADJUST AS NEEDED.

Hardware Group No. 35

For use on Door #(s):
3930

Provide each PR door(s) with the following:











QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	711		630	IVE
1	EA	FIRE EXIT HARDWARE	9849-L-BE-F-17		626	VON
1	EA	FIRE EXIT HARDWARE	9849-L-BE-F-17-LBLAFL		626	VON
2	EA	SURFACE CLOSER	4040XP EDA WMS		689	LCN
2	EA	KICK PLATE	8400 16" X 1" LDW B-CS		630	IVE
2	EA	WALL STOP	WS406/407CVX		626	IVE
2	EA	MAGNET	SEM7850 12V/24V/120V		689	LCN
1	EA	GASKETING	488SBK PSA		BK	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER

Hardware Group No. 36

For use on Door #(s):

A103A A104A A109A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	INTERMEDIATE PIVOT	7226F PT_INT TW8 CON_Y		✓ 630	IVE
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-DT-17-CON 24 VDC		✓ 626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-NL-17-CON 24 VDC		✓ 626	VON
1	EA	RIM CYLINDER	REUSE EXISTING CYLINDER		626	BES
2	EA	OH STOP	90S J		630	GLY
2	EA	FIRE/LIFE CLOSER	3134SE AC/DC		✓ 689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	SOUND GASKETING	870AA-S (HEAD AND JAMBS)		AA	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER
2	EA	DOOR BOTTOM	355AA		AA	ZER
2	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ		✓	SCH
2	EA	WIRE HARNESS	CON-6W		✓	SCH
		ACCESS CONTROL - WORK OF DIVISION 28			✓	
		DOOR CONTACT(S) - WORK OF DIV. 28			✓	
		COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28			✓	
		REMAINDER OF HARDWARE EXISTING				

PATCH, PLUG AND REPAIR FRAME AS REQUIRED. VERIFY PIVOT SPECIFIED AND REUSE OR REPLACE AS REQUIRED (VERIFY PRIOR TO ORDERING). VERIFY SIZE AND TEMPLATING OF 3130SE CONCEALED CLOSER HOLDERS PRIOR TO ORDERING OR TEMPATING DOOR. SURFACE OVERHEAD STOPS TO BE MOUNTED PULL SIDE TO AVOID SOUND GASKETING. TEMPLATE AS REQUIRED FOR PROPER HOLDING AND STOPPING. REUSE EXISTING CYLINDER. CUSTOM SHIM MAY BE REQUIRED TO WIDEN STOP WIDTH FOR MOUNTING OF GASKETING TO HM STOP.

Hardware Group No. 37

For use on Door #(s):
A103B

Provide each SGL door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8	✓ 652	IVE
1	EA ELEC FIRE EXIT HARDWARE	RX-QEL-9875-L-NL-F-17-CON 24 VDC	✓ 626	VON
1	EA MORTISE CYLINDER	REUSE EXISTING CYLINDER	626	BES
1	EA SURFACE CLOSER	4040XP EDA WMS	689	LCN
1	EA GASKETING	488SBK PSA	BK	ZER
1	EA GASKETING	488SBK PSA	BK	ZER
1	EA WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓	SCH
1	EA WIRE HARNESS	CON-6W	✓	SCH
		ACCESS CONTROL - WORK OF DIVISION 28	✓	
		DOOR CONTACT(S) - WORK OF DIV. 28	✓	
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME		
		POWER SUPPLY - WORK OF DIVISION 28	✓	
		REMAINDER OF HARDWARE EXISTING		









PATCH, PLUG AND REPAIR FRAME AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING.

Hardware Group No. 38

For use on Door #(s):

A104B A108B S6501 S6510 S6520

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8		✓ 652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-9875-L-F-M996-17-FS-CON		✓ 626	VON
1	EA	MORTISE CYLINDER	REUSE EXISTING CYLINDER		626	BES
1	EA	SURFACE CLOSER	4040XP EDA WMS		689	LCN
1	EA	MAGNET	SEM7850 12V/24V/120V		689	LCN
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	SOUND GASKETING	870AA-S (HEAD AND JAMBS)		AA	ZER
1	EA	DOOR BOTTOM	355AA		AA	ZER
1	EA	MOUNTING BRACKET	870SPB			ZER
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ		✓	SCH
1	EA	WIRE HARNESS	CON-6W		✓	SCH
		ACCESS CONTROL - WORK OF DIVISION 28			✓	
		DOOR CONTACT(S) - WORK OF DIV. 28			✓	
		COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28			✓	
		REMAINDER OF HARDWARE EXISTING				

PATCH, PLUG AND REPAIR FRAME AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS
PRIOR TO ORDERING.

Hardware Group No. 39

For use on Door #(s):

A105A	A106A	A107A	A108A	C120A	C121A
C122A	C123A	C124A	C125A	C126A	

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	PIVOT SET	7226F SET		630	IVE
2	EA	INTERMEDIATE PIVOT	7226F PT_INT TW8 CON_Y		✓ 630	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-9849-EO-F-LBLAFL-CON		✓ 626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-NL-17 24 VDC		✓ 626	VON
1	EA	RIM CYLINDER	REUSE EXISTING CYLINDER		626	BES
2	EA	OH STOP	90S J		630	GLY
2	EA	FIRE/LIFE CLOSER	3134SE AC/DC		✓ 689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	SOUND GASKETING	870AA-S (HEAD AND JAMBS)		AA	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER
2	EA	DOOR BOTTOM	355AA		AA	ZER
2	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ		✓	SCH
2	EA	WIRE HARNESS	CON-6W		✓	SCH
			ACCESS CONTROL - WORK OF DIVISION 28		✓	
			DOOR CONTACT(S) - WORK OF DIV. 28		✓	
			COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28		✓	
			REMAINDER OF HARDWARE EXISTING			

PATCH, PLUG AND REPAIR FRAME AS REQUIRED. VERIFY PIVOT SPECIFIED AND REUSE OR REPLACE AS REQUIRED (VERIFY PRIOR TO ORDERING). VERIFY SIZE AND TEMPLATING OF 3130SE CONCEALED CLOSER HOLDERS PRIOR TO ORDERING OR TEMPLATING DOOR. SURFACE OVERHEAD STOPS TO BE MOUNTED PULL SIDE TO AVOID SOUND GASKETING. TEMPLATE AS REQUIRED FOR PROPER HOLDING AND STOPPING. REUSE EXISTING CYLINDER. CUSTOM SHIM MAY BE REQUIRED TO WIDEN STOP WIDTH FOR MOUNTING OF GASKETING TO HM STOP.

Hardware Group No. 40

For use on Door #(s):

A106B	A106C	B113C	B113D	B114C	B115C
B116C	B116D	C123B	C123C	C124B	

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8		✓ 652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-9849-L-DT-F-17-LBLAFL-CON		✓ 626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-L-NL-F-17-CON 24 VDC		✓ 626	VON
1	EA	RIM CYLINDER	REUSE EXISTING CYLINDER		626	BES
2	EA	OH STOP	90S		630	GLY
2	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC		✓ 689	LCN
2	EA	MOUNTING PLATE	4040SE-18 WMS		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	SOUND GASKETING	870AA-S (HEAD AND JAMBS)		AA	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER
2	EA	DOOR BOTTOM	355AA		AA	ZER
2	EA	MOUNTING BRACKET	870SPB			ZER
2	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ		✓	SCH
2	EA	WIRE HARNESS	CON-6W		✓	SCH
		ACCESS CONTROL - WORK OF DIVISION 28			✓	
		DOOR CONTACT(S) - WORK OF DIV. 28			✓	
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28			✓	
		REMAINDER OF HARDWARE EXISTING				











PATCH, PLUG AND REPAIR FRAME AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS AND ADJUST AS REQUIRED PRIOR TO ORDERING. TRACK HOLDER CLOSERS TO BE MOUNTED PULL SIDE. SURFACE OVERHEAD STOPS TO BE MOUNTED PUSH SIDE TO THE MOUNTING BRACKETS SPACED OVER SOUND GASKETING. TEMPLATE AS REQUIRED FOR PROPER HOLDING AND STOPPING. REUSE EXISTING CYLINDER. REPLACE DOORS AS REQUIRED.

Hardware Group No. 41

For use on Door #(s):

A107B	A109B	B110B	B111B	B112B	B117B
B118B	B119B	C120B	C121B	C122B	C126B

Provide each SGL door(s) with the following:











QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8	 ✓	652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9875-L-NL-F-17-CON 24 VDC	 ✓	626	VON
1	EA	MORTISE CYLINDER	REUSE EXISTING CYLINDER		626	BES
1	EA	OH STOP	90S		630	GLY
1	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC	 ✓	689	LCN
1	EA	MOUNTING PLATE	4040SE-18 WMS		689	LCN
21	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	SOUND GASKETING	870AA-S (HEAD AND JAMBS)		AA	ZER
1	EA	DOOR BOTTOM	355AA		AA	ZER
1	EA	MOUNTING BRACKET	870SPB			ZER
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓		SCH
1	EA	WIRE HARNESS	CON-6W	✓		SCH
		ACCESS CONTROL - WORK OF DIVISION 28		✓		
		DOOR CONTACT(S) - WORK OF DIV. 28		✓		
		COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✓		
		REMAINDER OF HARDWARE EXISTING				

PATCH, PLUG AND REPAIR FRAME AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS AND ADJUST AS REQUIRED PRIOR TO ORDERING. TRACK HOLDER CLOSERS TO BE MOUNTED PULL SIDE. SURFACE OVERHEAD STOP TO BE MOUNTED PUSH SIDE TO THE MOUNTING BRACKETS SPACED OVER SOUND GASKETING. TEMPLATE AS REQUIRED FOR PROPER HOLDING AND STOPPING. REUSE EXISTING CYLINDER.

Hardware Group No. 42

For use on Door #(s):
 A112B





Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	705 EPT		630	IVE
2	EA	POWER TRANSFER	EPT10 CON		✓ 689	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9847-L-DT-F-17-CON 24 VDC		✓ 626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-L-NL-F-17-CON 24 VDC		✓ 626	VON
1	EA	RIM CYLINDER HOUSING	12E72-S2-RP3		626	BES
2	EA	SURFACE CLOSER	4040XP EDA WMS		689	LCN
2	EA	ARMOR PLATE	8402 34" X 1" LDW B-CS		630	IVE
2	EA	WALL STOP	WS406/407CVX		626	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER
			ACCESS CONTROL - WORK OF DIVISION 28	✓		
			DOOR CONTACT(S) - WORK OF DIV. 28	✓		
			COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28	✓		

Hardware Group No. 43

For use on Door #(s):
C125B

Provide each SGL door(s) with the following:








QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8		✓ 652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9875-L-NL-F-17-CON 24 VDC		✓ 626	VON
1	EA	MORTISE CYLINDER	REUSE EXISTING CYLINDER		626	BES
1	EA	SURFACE CLOSER	4040XP EDA WMS		689	LCN
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ		✓	SCH
1	EA	WIRE HARNESS	CON-6W		✓	SCH
		ACCESS CONTROL - WORK OF DIVISION 28			✓	
		DOOR CONTACT(S) - WORK OF DIV. 28			✓	
		COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28			✓	
		REMAINDER OF HARDWARE EXISTING				

PATCH, PLUG AND REPAIR FRAME AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS
PRIOR TO ORDERING.

Hardware Group No. 44

For use on Door #(s):
C130B

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	FIRE EXIT HARDWARE	9849-L-BE-F-17		626	VON
1	EA	FIRE EXIT HARDWARE	9849-L-BE-F-17-LBLAFL		626	VON
2	EA	SURFACE CLOSER	4040XP EDA WMS		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	WALL STOP	WS406/407CVX		626	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER

















VERIFY IF ACCESS CONTROL IS REQUIRED.

Hardware Group No. 45

For use on Door #(s):

D133B D134B E147B E148B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	ARMORED DOOR CORD	K-DL38A		689	KEE
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9875-L-NL-F-17-CON 24 VDC	 	626	VON
1	EA	MORTISE CYLINDER	REUSE EXISTING CYLINDER		626	BES
1	EA	OH STOP	90S J		630	GLY
1	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC	 	689	LCN
1	EA	ARMOR PLATE	8402 34" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	SOUND GASKETING	870AA-S (HEAD AND JAMBS)		AA	ZER
1	EA	DOOR BOTTOM	355AA		AA	ZER
1	EA	MOUNTING BRACKET	870SPB			ZER
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ			SCH
1	EA	WIRE HARNESS	CON-6W			SCH
		ACCESS CONTROL - WORK OF DIVISION 28				
		DOOR CONTACT(S) - WORK OF DIV. 28				
		COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28				
		REMAINDER OF HARDWARE EXISTING				











PATCH, PLUG AND REPAIR FRAME AS REQUIRED. VTRACK HOLDER CLOSER TO BE MOUNTED PUSH SIDE. SURFACE OVERHEAD STOP TO BE MOUNTED PULL SIDE. TEMPLATE AS REQUIRED FOR PROPER HOLDING AND STOPPING. REUSE EXISTING CYLINDER.

Hardware Group No. 46

For use on Door #(s):

D135B E146B F149B F152B

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	ARMORED DOOR CORD	K-DL38A		689	KEE
1	EA	ELEC FIRE EXIT HARDWARE	RX-9849-L-DT-F-17-LBLAFL- CON	 ✎	626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-L-NL-F-17-CON 24 VDC	 ✎	626	VON
1	EA	RIM CYLINDER	REUSE EXISTING CYLINDER		626	BES
2	EA	SURFACE CLOSER	4040XP EDA WMS		689	LCN
2	EA	ARMOR PLATE	8402 34" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	SOUND GASKETING	870AA-S (HEAD AND JAMBS)		AA	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER
2	EA	DOOR BOTTOM	355AA		AA	ZER
2	EA	MOUNTING BRACKET	870SPB			ZER
2	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ		✎	SCH
2	EA	WIRE HARNESS	CON-6W		✎	SCH
		ACCESS CONTROL - WORK OF DIVISION 28			✎	
		DOOR CONTACT(S) - WORK OF DIV. 28			✎	
		COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28			✎	
		REMAINDER OF HARDWARE EXISTING				














PATCH, PLUG AND REPAIR FRAME AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS AND ADJUST AS REQUIRED PRIOR TO ORDERING. REUSE EXISTING CYLINDER. REPLACE DOORS AS REQUIRED.

Hardware Group No. 47

For use on Door #(s):

D136B	D137B	D138B	D139B	D140B	E141B
E142B	E143B	E144B	E145B	F150B	F151B
G129C	G130B	G131B	G132B		

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	ARMORED DOOR CORD	K-DL38A		689	KEE
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9875-L-NL-F-17-CON 24 VDC	 	626	VON
1	EA	MORTISE CYLINDER	REUSE EXISTING CYLINDER		626	BES
1	EA	SURFACE CLOSER	4040XP EDA WMS		689	LCN
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	SOUND GASKETING	870AA-S (HEAD AND JAMBS)		AA	ZER
1	EA	DOOR BOTTOM	365AA		AA	ZER
1	EA	MOUNTING BRACKET	870SPB			ZER
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ			SCH
1	EA	WIRE HARNESS	CON-6W			SCH
		ACCESS CONTROL - WORK OF DIVISION 28				
		DOOR CONTACT(S) - WORK OF DIV. 28				
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28				
		REMAINDER OF HARDWARE EXISTING				










PATCH, PLUG AND REPAIR FRAME AS REQUIRED. REPLACE DOORS AS REQUIRED.

Hardware Group No. 48

For use on Door #(s):

XA00A	XB00A	XB00C	XB00G	XB00J	XC00A
XD00A	XE00C				

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8	 ✓	652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-9849-L-DT-F-17-LBLAFL- CON	 ✓	626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-L-NL-F-17-CON 24 VDC	 ✓	626	VON
2	EA	OH STOP	100S		630	GLY
2	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC	 ✓	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER
2	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓		SCH
2	EA	WIRE HARNESS	CON-6W	✓		SCH
			ACCESS CONTROL - WORK OF DIVISION 28	✓		
			DOOR CONTACT(S) - WORK OF DIV. 28	✓		
			COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28	✓		
1			REMAINDER OF HARDWARE EXISTING			









PATCH, PLUG AND REPAIR DOORS AND FRAME AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNES PRIOR TO ORDERING. REPLACE DOORS AS REQUIRED.

Hardware Group No. 49

For use on Door #(s):

XA00B	XA00C	XA00D	XA00E	XA00F	XA00G
XB00B	XB00D	XB00E	XB00F	XB00K	XB00L
XB00M	XC00B	XC00C	XC00D	XC00E	XC00F
XC00G	XD00B	XD00C	XD00D	XD00E	XD00F
XE00D	XE00E	XE00F			

Provide each PR door(s) with the following:







QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
8	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
1	EA	FIRE EXIT HARDWARE	9849-L-DT-F-06		626	VON
1	EA	FIRE EXIT HARDWARE	9849-L-DT-F-06-LBLAFL		626	VON
2	EA	OH STOP	100S		630	GLY
2	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC	 ✎	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER

PATCH, PLUG AND REPAIR DOORS AS REQUIRED. REPLACE DOORS IF NOT REPAIRABLE OR WILL NO HOLD LABELING FROM PANIC DEVICE CHANGES.

Hardware Group No. 50

For use on Door #(s):
 XA00Q

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8	 ✓	630	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB		689	VON
1	EA	ELEC PANIC HARDWARE	LD-RX-98-EO-CON	 ✓	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-NL-OP-110MD-CON 24 VDC	 ✓	626	VON
1	EA	RIM CYLINDER	REUSE EXISTING CYLINDER		626	BES
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	MULLION SEAL	8780NBK PSA		BK	ZER
2	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓		SCH
2	EA	WIRE HARNESS	CON-6W	✓		SCH
		ACCESS CONTROL - WORK OF DIVISION 28		✓		
		DOOR CONTACT(S) - WORK OF DIV. 28		✓		
		COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✓		
		REMAINDER OF HARDWARE EXISTING				












PATCH, PLUG AND REPAIR FRAME AS REQUIRED. REUSE EXISTING CYLINDER. VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING.

Hardware Group No. 51

For use on Door #(s):

1176 XA00R

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
7	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 CON TW8	 ⚡	652	IVE
1	EA	AUTO FLUSH BOLT	FB31T		630	IVE
1	EA	EU MORTISE LOCK	L9092BDEU 17A RX CON 12/24 VDC	 ⚡	626	SCH
1	EA	COORDINATOR	COR X FL		628	IVE
1	EA	OH STOP	90S		630	GLY
2	EA	SURFACE CLOSER	4040XP REG WMS		689	LCN
2	EA	ARMOR PLATE	8402 34" X 1" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CVX		626	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	ASTRAGAL	383AA		AA	ZER
1	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	⚡		SCH
1	EA	WIRE HARNESS	CON-6W	⚡		SCH
		ACCESS CONTROL - WORK OF DIVISION 28		⚡		
		DOOR CONTACT(S) - WORK OF DIV. 28		⚡		
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		⚡		
		REMAINDER OF HARDWARE EXISTING				










VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. ADJUST AS REQUIRED. CUT HOLES FOR HARDWARE IN ARMOR PLATE AS REQUIRED. PATCH PLUG AND REPAIR DOOR AS REQUIRED. DOORS MAY NEED REPLACING.

Hardware Group No. 52

For use on Door #(s):

XA10A XC10A XC10C XD10A XD10B XD10C

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8		✓ 652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-9849-L-DT-F-17-LBLAFL- CON		✓ 626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-L-NL-F-17-CON 24 VDC		✓ 626	VON
1	EA	RIM CYLINDER	REUSE EXISTING CYLINDER		626	BES
2	EA	OH STOP	90S		630	GLY
2	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC		✓ 689	LCN
2	EA	MOUNTING PLATE	4040SE-18 WMS		689	LCN
2	EA	ARMOR PLATE	8402 34" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	MEETING ASTRAGAL	8193AA (ONE SET)		AA	ZER
2	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ		✓	SCH
2	EA	WIRE HARNESS	CON-6W		✓	SCH
			ACCESS CONTROL - WORK OF DIVISION 28		✓	
			DOOR CONTACT(S) - WORK OF DIV. 28		✓	
			COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28		✓	
			REMAINDER OF HARDWARE EXISTING			









PATCH, PLUG AND REPAIR FRAME AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. REPLACE DOORS AS REQUIRED. TRACK HOLDER CLOSERS TO BE MOUNTED PULL SIDE. SURFACE OVERHEAD STOPS TO BE MOUNTED PUSH SIDE. TEMPLATE AS REQUIRED FOR PROPER HOLDING AND STOPPING. REUSE EXISTING CYLINDER.

Hardware Group No. 53

For use on Door #(s):

XA10B XC10B XC10D

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8	 ✎	652	IVE
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-L-NL-17 24 VDC	 ✎	626	VON
1	EA	RIM CYLINDER	REUSE EXISTING CYLINDER		626	BES
1	EA	OH STOP	90S		630	GLY
1	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC	 ✎	689	LCN
1	EA	MOUNTING PLATE	4040SE-18 WMS		689	LCN
1	EA	ARMOR PLATE	8402 34" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	MEETING ASTRAGAL	8193AA (ONE SET)		AA	ZER
2	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✎		SCH
2	EA	WIRE HARNESS	CON-6W	✎		SCH
			ACCESS CONTROL - WORK OF	✎		
			DIVISION 28			
			DOOR CONTACT(S) - WORK OF	✎		
			DIV. 28			
			COORDINATE WITH SECURITY-			
			PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF	✎		
			DIVISION 28			
			REMAINDER OF HARDWARE			
			EXISTING			

PATCH, PLUG AND REPAIR FRAME AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING. REPLACE DOOR AS REQUIRED. TRACK HOLDER CLOSER TO BE MOUNTED PULL SIDE. SURFACE OVERHEAD STOP TO BE MOUNTED PUSH SIDE. TEMPLATE AS REQUIRED FOR PROPER HOLDING AND STOPPING. REUSE EXISTING CYLINDER.

Hardware Group No. 54

For use on Door #(s):

XB00H XB00I

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1			EXISTING HARDWARE TO REMAIN			

Hardware Group No. 55

For use on Door #(s):
XB00N

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8		✓ 652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9847-L-DT-F-17-CON 24 VDC		✓ 626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-L-NL-F-17-CON 24 VDC		✓ 626	VON
2	EA	OH STOP	100S		630	GLY
2	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC		✓ 689	LCN
2	EA	ARMOR PLATE	8402 34" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER
			ACCESS CONTROL - WORK OF DIVISION 28	✓		
			DOOR CONTACT(S) - WORK OF DIV. 28	✓		
			COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28	✓		

PATCH, PLUG AND REPAIR DOORS AS REQUIRED. REPLACE DOORS IF NOT REPAIRABLE OR WILL NOT HOLD LABELING FROM PANIC DEVICE CHANGES. VERIFY HINGE HEIGHT AND THICKNESS PRIOR TO ORDERING.

Hardware Group No. 56

For use on Door #(s):
XB00O

Provide each PR door(s) with the following:





QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
8	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
1	EA	FIRE EXIT HARDWARE	9849-L-DT-F-06		626	VON
1	EA	FIRE EXIT HARDWARE	9849-L-DT-F-06-LBLAFL		626	VON
2	EA	OH STOP	100S		630	GLY
2	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC		✓ 689	LCN
2	EA	ARMOR PLATE	8402 34" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	SET	MEETING STILE ASTRAGAL	8878AA-S		AA	ZER

PATCH, PLUG AND REPAIR DOORS AS REQUIRED. REPLACE DOORS IF NOT REPAIRABLE OR WILL NOT HOLD LABELING FROM PANIC DEVICE CHANGES.

Hardware Group No. 57

For use on Door #(s):
XE00A

Provide each PR door(s) with the following:





QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8	 ✓	652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9827-L-DT-F-LBRAFL- 17-499F 24 VDC	 ✓	626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9827-L-NL-F-LBR-17- 499F 24 VDC	 ✓	626	VON
2	EA	ARMOR PLATE	8402 34" X 1" LDW B-CS		630	IVE
		ACCESS CONTROL - WORK OF DIVISION 28		✓		
		DOOR CONTACT(S) - WORK OF DIV. 28		✓		
		COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✓		
		REMAINDER OF HARDWARE EXISTING				

PATCH PLUG AND REPAIR DOORS AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS
PRIOR TO ORDERING.

Hardware Group No. 58

For use on Door #(s):
XE00B

Provide each PR door(s) with the following:








QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8	 ✓	652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-9827-L-DT-F-LBRAFL-17- 499F	 ✓	626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-9827-L-NL-F-LBR-17-499F	 ✓	626	VON
2	EA	ARMOR PLATE	8402 34" X 1" LDW B-CS		630	IVE
		ACCESS CONTROL - WORK OF DIVISION 28		✓		
		DOOR CONTACT(S) - WORK OF DIV. 28		✓		
		COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✓		
		REMAINDER OF HARDWARE EXISTING				

PATCH PLUG AND REPAIR DOORS AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS
PRIOR TO ORDERING.

Hardware Group No. 59

For use on Door #(s):
 XE00G

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 CON TW8	 ✓	652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	RX-9849-EO-F-CON	 ✓	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-9849-L-NL-17-CON 24 VDC	 ✓	626	VON
2	EA	SURFACE CLOSER	4040XP SCUSH WMS		689	LCN
2	EA	ARMOR PLATE	8402 48" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
2	EA	MEETING ASTRAGAL	8193AA (ONE SET)		AA	ZER
2	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓		SCH
2	EA	WIRE HARNESS	CON-6W	✓		SCH
		ACCESS CONTROL - WORK OF DIVISION 28		✓		
		DOOR CONTACT(S) - WORK OF DIV. 28		✓		
		COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✓		
		REMAINDER OF HARDWARE EXISTING				








PATCH, PLUG AND REPAIR FRAME AS REQUIRED. REPLACE DOORS AS REQUIRED. CUT
 ARMOR PLATE FOR HARDWARE AS REQUIRED. VERIFY HINGE HEIGHT AND THICKNESS PRIOR
 TO ORDERING.

Hardware Group No. 60

For use on Door #(s):

XE00H XE00I

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	ELEC FIRE EXIT HARDWARE	RX-9849-L-DT-F-17-LBLAFL- CON	 ✓	626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-9849-L-NL-F-17-CON 24 VDC	 ✓	626	VON
1	EA	RIM CYLINDER	REUSE EXISTING CYLINDER		626	BES
2	EA	OH STOP	90S		630	GLY
2	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC	 ✓	689	LCN
2	EA	MOUNTING PLATE	4040SE-18 WMS		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	MEETING ASTRAGAL	8193AA (ONE SET)		AA	ZER
2	EA	WIRE HARNESS (DOOR)	CON-LENGTH AS REQ	✓		SCH
2	EA	WIRE HARNESS	CON-6W	✓		SCH
			ACCESS CONTROL - WORK OF DIVISION 28	✓		
			DOOR CONTACT(S) - WORK OF DIV. 28	✓		
			COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28	✓		
			REMAINDER OF HARDWARE EXISTING			

PATCH, PLUG AND REPAIR FRAME AS REQUIRED. REUSE EXISTING HINGES AND POWER TRANSFERS. REPLACE DOORS AS REQUIRED. TRACK HOLDER CLOSERS TO BE MOUNTED PULL SIDE. SURFACE OVERHEAD STOPS TO BE MOUNTED PUSH SIDE. TEMPLATE AS REQUIRED FOR PROPER HOLDING AND STOPPING. REUSE EXISTING CYLINDER.

Hardware Group No. 61

For use on Door #(s):

CD1836A CD1836B CD1871A CD1871B

Provide each RU door(s) with the following:




QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	MORTISE CYLINDER	REUSE EXISTING CYLINDER REMAINDER OF HARDWARE EXISTING	626	BES

Hardware Group No. 62

For use on Door #(s):

G129A G129B G130A

Provide each PR door(s) with the following:




QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
4	EA	DUMMY CYLINDER	38-070 118		626	SCH
1	EA	MAGNETIC LOCK	M492P ATS/LED-2 12/24 VDC	 ✓	628	SCE
1	EA	PUSH BUTTON	621GREX DA 12/24 VDC	 ✓	630	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	 ✓	WHT	SCE
		ACCESS CONTROL - WORK OF DIVISION 28		✓		
		DOOR CONTACT(S) - WORK OF DIV. 28		✓		
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✓		

Hardware Group No. 63

For use on Door #(s):

1171B 1836A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
4	EA	DUMMY CYLINDER	38-070 118		626	SCH
1	EA	MAGNETIC LOCK	M492P ATS/LED-2 12/24 VDC	 ✓	628	SCE
1	EA	PUSH BUTTON	621GREX DA 12/24 VDC	 ✓	630	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	 ✓	WHT	SCE
		ACCESS CONTROL - WORK OF DIVISION 28		✓		
		DOOR CONTACT(S) - WORK OF DIV. 28		✓		
		COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		✓		

CUSTOM BOLLARD TO BE SUPPLIED AND INSTALLED BY CONTRACTOR AS DIRECTED BY ARCHITECT. BOLLARDS TO BE MOUNTED BOTH SIDES OF GLASS TO HOUSE THE CARD READER AND REQUEST TO EXIT SWITCH. TRENCHING UNDER GLASS CHANNEL TO BE CONCEALED BY THE BOLLARDS. SURFACE WIRE MOLD OR OTHER METHODS TO CONCEAL WIRING A MUST. MAG HOLDERS ARE EXISTING.

Hardware Group No. 64

For use on Door #(s):

1180A 1839

Provide each PR door(s) with the following:









QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA DUMMY CYLINDER	38-070 118	626	SCH
1	EA MAGNETIC LOCK	M492P ATS/LED-2 12/24 VDC	628	SCE
2	EA MAGNET	SEM7820 12V/24V/120V	689	LCN
1	EA PUSH BUTTON	621GREX DA 12/24 VDC	630	SCE
1	EA MOTION SENSOR	SCANII 12/24 VDC	WHT	SCE
	ACCESS CONTROL - WORK OF DIVISION 28			
	DOOR CONTACT(S) - WORK OF DIV. 28			
	COORDINATE WITH SECURITY-PREP DOOR(S) AND FRAME			
	POWER SUPPLY - WORK OF DIVISION 28			

Hardware Group No. 65

For use on Door #(s):

1660 1670 3042 3043 3053 3054

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	POWER TRANSFER	EPT10 CON		✓ 689	VON
1	EA	PASSAGE SET	L9010 17A LESS LOCK CASE 625		626	SCH
1	EA	ELECTRIC RETRACTION MORTISE LOCK CASE-	Z7835- LESS TRIM		✓ 626	SDC
1	EA	SURF. AUTO OPERATOR	4631 WMS 120 VAC		✓ 689	LCN
2	EA	ACTUATOR, TOUCH	8310-856T		✓ 630	LCN
2	EA	MOUNT BOX	8310-868S			LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	WIRE HARNESS	CON-6W		✓	SCH
			ACCESS CONTROL - WORK OF DIVISION 28		✓	
			DOOR CONTACT(S) - WORK OF DIV. 28		✓	
			COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME			
			POWER SUPPLY - WORK OF DIVISION 28		✓	
1			PROVIDE RISER & POINT TO POINT WIRING DIAGRAMS			











NEW DOOR AND FRAME REQUIRED. FRAME TO HAVE A MIN OF 2" FACES FOR EPT. WHEN PRGRAMMED FOR USE LOCK TO BE INFULLY RETRACTED MODE AND BOTH ACTUATORS TO OPPERATE DOOR. WHEN THE RESTROOMS ARE TO BE LOCKED THE LATCH BOLT WILL BE IN NORMAL LOCKED AND LATCHED MODE AND ONLY THE INTERIOR ACTUATOR WILL MOMENTARILY ACTIVATE THE LATCH RETRACTION MORTISE LOCK AND ACTIVATE THE DOOR. EXTERIOR ACTUATOR IN NIGHT MODE WILL NOT ACTIVATE THE LOCK OR THE AUTO OPERATOR

Hardware Group No. 66

For use on Door #(s):

3043A 3053A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	FAC RESTRM /HOTEL W/IND W/ OUTSIDE INDICATOR	L9486L 17A L583-363 L583-375		626	SCH
1	EA	MORTISE CYLINDER	1E74 C265 RP3		626	BES
1	EA	ELECTRIC STRIKE	6400 FSE 12/24 VAC/VDC	 ⚡	630	VON
1	EA	SURF. AUTO OPERATOR	4642 TBWMS	 ⚡	689	LCN
2	EA	ACTUATOR, TOUCH	8310-856T	 ⚡	630	LCN
2	EA	MOUNT BOX	8310-868S			LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CVX		626	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	WIRE HARNESS	CON-6W	⚡		SCH
		ACCESS CONTROL - WORK OF DIVISION 28		⚡		
		DOOR CONTACT(S) - WORK OF DIV. 28		⚡		
		COORDINATE WITH SECURITY- PREP DOOR(S) AND FRAME				
		POWER SUPPLY - WORK OF DIVISION 28		⚡		

EXISTING FRAME WILL NEED TO BE RE-LABELED / CERTIFIED DUE TO THE NEW ELECTRIC STRIKE NEEDING TO BE ADDED. FRAME TO HAVE A 2" FACED FRAME MIN.

END OF SECTION

DIVISION 09

FINISHES

PART 1 GENERAL

1.1 SUMMARY

- A. In general, the principal items of work include, but are not limited to, the following:
 - 1. Preparation of surfaces.
 - 2. Field application of paints.
 - 3. Touch-up paint all blemished or otherwise disfigured paint on existing surfaces where work performed.
 - 4. Field painting of prime painted finished door hardware to match the door frame. Hardware includes, but is not limited to, coordinators' housing and associated door closer mounting brackets on door frames, astragals, and other items as required.

1.2 SUBMITTALS

- A. General: Make submittals in accordance with Section 013300 - Submittal Procedures.
- B. Product Data: Submit complete list of products proposed for use, including technical data on each product to verify compliance; organize list to indicate painting systems to be used with each substrate.
 - 1. Organize the paint submittal to follow the format in Part 2 of this Section in order to indicate painting systems to be used with each substrate.
 - 2. Submittal shall contain any proposed revisions to specifications (i.e. surface preparation, method of application, etc.) which contractor feels are necessary in their execution of the Contract.
 - 3. Any proposed revisions must be approved by the Architect prior to proceeding with the Work.
- C. Submit paint manufacturer's product data sheets and Environmental Data Sheets highlighting VOC limits for each paint or coating used in the building.
- D. Samples: Using approved materials, prepare and submit samples of each type of finish, gloss, and color for approval. Label samples with color number, name and date. Provide one (1) samples each.
 - 1. Prepare paint color samples on 8-1/2 inch by 11 inch heavy, durable non porous paper.
 - 2. Furnish additional samples as required until colors and finishes are approved.
 - 3. Provide a list of materials and applications for each coat of each sample. Label each sample for location and application.
- E. Submit samples on the following substrates for the Architect's review of color and texture only:
 - 1. Ferrous Metal: Provide one 4-inch square sample of flat metal and one 8-inch long sample of solid metal for each color and finish.

- F. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- G. Section 017700 - Closeout Procedures.
 - 1. Include a Paint Project Summary with finish schedule, including detail designating where each product/color/finish was used, Product Data pages, Material Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.3 QUALITY ASSURANCE

- A. Single Source:
 - 1. To the maximum extent practicable, select a single manufacturer to provide all materials required by this Section, using additional manufacturers to provide systems not offered by the selected principal manufacturer.
 - 2. For each individual system, provide primer and other undercoat paint produced by same manufacturer as finish coat. Use only thinners approved by paint manufacturer and use only within recommended limits.
 - 3. Contractor grades are not acceptable.
- B. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this project with a record of successful in-service performance. The contractor is to have a foreman on site during preparation and painting work.
- C. Visual Standards: Each distinct area of the finished Work shall be free of variations in color and sheen, runs, sags, holidays, blistering, checking, cracking, scratches and other signs of poor workmanship.
- D. Pre-Work Meeting
 - 1. Convene minimum one week prior to commencing work of this section.

1.4 DELIVERY, STORAGE AND HANDLING

- A. General: Comply with requirements specified in Section 016000 - Product Requirements.
- B. Deliver materials to building in sealed, original, labeled containers bearing manufacturer's name, type of material, brand name, color designation, and instructions for mixing and thinning.
- C. Store materials in tightly covered containers when not in actual use in a place specifically assigned for that purpose which is well-ventilated, dry and out of direct sunlight. Store materials in a manner so as not to exceed the manufacturer's temperature limitations.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing and application.

1.5 PROJECT CONDITIONS

- A. Environmental Conditions: Air temperature and substrate temperature and relative humidity shall be within the manufacturer's established limits. Do not apply exterior paint when the following conditions exist, unless requirements of paint manufacturers are more restrictive.
 1. Temperature: If surface and ambient temperature is above 90 degrees F, or below 50-degrees F.
 2. Relative Humidity: If relative humidity is above 85 percent.
 3. Weather: During damp and inclement weather or during excessively windy weather.
- B. Lighting: Do not proceed with work under this section unless adequate lighting is available. Provide lighting level of at least 50 candlepower per square foot, measured mid-height at substrate surface.
- C. Ventilation: Provide adequate ventilation as required for the type of paint and cleaning materials used. If necessary, consult paint manufacturer for recommendations.
- D. Protection: Protect surrounding areas against damage due to painting operations. At a minimum, surrounding areas shall be covered with polyethylene sheeting and waterproof masking tape. The Owner shall not be responsible for Contractor's selection or method of protection.
 1. Protective coverings shall be secured against wind and shall be vented to prevent collection of moisture on covered surfaces.
 2. Provide "wet paint" signs as required to protect newly painted surfaces.
- E. Precautions: Take all precautions to prevent fire; open containers of inflammable materials only when needed; keep rubbing cloths and oily rags in tightly closed containers and remove from site daily. Dispose of hazardous materials in accordance with all local, State and Federal regulations.

1.6 COORDINATION

- A. Review other sections in which prime paints are to be provided to ensure compatibility of total coating system for various substrates. Notify Architect in writing of any anticipated problems using specified coating systems with substrates primed by others.

1.7 TESTING FOR ADHESION

- A. Field Testing: Field test primers which are to be applied. The purpose of this field testing will be to ensure compatibility and total adhesion of the materials to the various substrates. Notify Architect if results of any test are not in total conformance with the paint manufacturer's specifications. Commencement of work constitutes full responsibility for any resulting unsatisfactory finish.

1.8 MAINTENANCE

- A. Extra Materials: Furnish Owner with an additional 1 gallon of each material and color applied along with color book.

1.9 WARRANTY

- A. Warrant and guarantee the work of this section against failure or non- performance for one year from the date of substantial completion. Failure or non-performance shall be corrected promptly upon discovery by the owner. Correction work will follow project specifications.
- B. Warranty not applicable for failure of substrates, or work by others.

PART 2 PRODUCTS

2.1 DESIGN REQUIREMENT

- A. VOC Content Requirements for Wet Applied Products: All paints and coatings wet -applied on site must meet the applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAMD) Rule 1113.
 - 1. Low-Emitting Materials: Meet VOC requirements listed below.
 - 2. Methylene chloride and perchloroethylene shall not be intentionally added in paints, coatings, adhesives or sealants.

2.2 ACCEPTABLE MANUFACTURERS

- A. Sherwin-Williams Company, Tel. 1-800-321-8194 (Technical Hotline), Website <http://www.sherwin-williams.com>
- B. Benjamin Moore, Tel. 1-800-642-5678 Ext. 2217, Website <http://www.benjaminmoore.com>
- C. PPG Architectural Coatings, Website: <http://www.ppgac.com/>
- D. Miller Paints, Website: <http://www.millerpaint.com/>
- E. Rodda/Cloverdale Paint Company, Website <http://www.roddapaint.com>
- F. Substitution Requests: Submit for acceptance under provisions of Section 012500.

2.3 PAINT MATERIALS

- A. Material Compatibility: Provide block fillers, primers, undercoats and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

C. VOC Compliance:

1. General Emissions Evaluation: Interior products must be tested and determined compliant in accordance with the California Department of Public Health (CDPH) Standard Method v1.1–2010 or the most current version, using the applicable exposure scenario.
2. VOC Content Requirements for Wet Applied Products: All paints and coatings wet-applied on site must meet the applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings or the South Coast Air Quality Management District (SCAQMD) Rule 1113, effective February 5, 2016.

D. Paint Content Restrictions:

1. All interior latex paints and coatings must be free of alkylphenol ethoxylates (APEs). This means paint products do not contain intentionally added or unintentionally added/residual APEs (above 100 ppm) using, at a minimum, the list of CAS#s in Pharos:
<https://pharosproject.net/chemicals/2089943#hazards-panel>
2. Epoxy paint should avoid bisphenols including BPA and BPS.
3. Products with antimicrobials marketed with a health claim are not acceptable.

E. Interior Surfaces

1. Ferrous Metal: Including factory primed Doors, Frames
 - a. One Primer Coat: Prime unprimed, bare metal (only), with water based corrosion resistant primer.
 - 1) Sherwin Williams: Pro Industrial Pro-Cryl Universal Primer B66W00310 (<100 g/L VOC).
 - 2) PPG Paints: 4020 Pitt-Tech Plus DTM Industrial Primer.
 - 3) Benjamin Moore: Ultra Spec® HP Acrylic Metal Primer HP04.
 - 4) Cloverdale 70323 Ecologic® Rustex Primer.
 - 5) Miller Paint: Acrimetal DTM Primer Interior Exterior 5000.
 - b. Two Finish Coats: Light industrial water based coating, Semi-Gloss, resistant to harsh cleaners, light abrasion and softening by constant hand contact.
 - 1) Sherwin Williams: Pro Industrial Pre-Catalyzed W/B Epoxy Semi-Gloss K46 Series (141 g/L VOC).
 - 2) PPG Paints: 16-510 Pitt-Glaze WB1 Interior Semi-Gloss Pre-Catalyzed Water-Borne Acrylic Epoxy.
 - 3) Benjamin Moore: Corotech Pre-Catalyzed Waterborne Epoxy Semi Gloss V341.

- 4) Rodda: Cloverdale 70623 Ecologic Interior - Exterior, 100% Acrylic Latex Semi-Gloss Finish.
- 5) Miller Paint: Waterborne Epoxy Semi Gloss 183-5-10.
- 2. Colors: Each paint color must be accurately mixed to ensure color continuity. No allowance will be granted for mis-matched paint of the same color when viewed under normal lighting conditions. Refer to Finish and Color Schedule for color selections.
- F. Provide primer and finish coats which are compatible with each other and with prime coats provided under other Sections. Provide barrier coats over incompatible primers or remove and re-prime as required.
- G. Tint each undercoat a lighter shade than finish coat so that numbers of coats can be easily discerned. No color mixing will be allowed at the job-site.
- H. Thinner: Type as recommended by the paint manufacturer. Use thinner only when recommended by the paint manufacturer, and then only in a quantity as indicated on the label.
- I. Primers: Primers, except metal primers, shall be white in color for inspection purposes.
- J. Secondary Products: Secondary products not specified by name and required for the job such as shellac, oils, patching compounds, putty, etc., shall be "best grade" products.

PART 3 EXECUTION

3.1 EXAMINATION

- A. General: Examine surfaces to receive paint finish for conditions that will adversely affect execution, performance, or quality of work and which cannot be put into an acceptable condition through reasonable preparatory work as specified herein.
 - 1. Surfaces which are unfit to receive the work of this section shall be repaired, replaced or re-finished such that they are acceptable and such that the work of this section may be done as specified. It shall be the responsibility of the General Contractor to ensure that these provisions are strictly enforced.
 - 2. Commencement of Work constitutes acceptance of surfaces and conditions.

3.2 SURFACE PREPARATION (GENERAL)

- A. General: Surface preparations and cleaning procedures shall be in strict accordance with the instructions and specifications of the paint manufacturer and with the requirements of this specification.
- B. Painting of Factory-Primed Door Hardware: Prior to painting, mask all operating parts so that item works freely after paint is dry. Remove any excess paint from operating parts and clean and free-up the operation of any parts which do not operate smoothly due to the painting operation.
- C. Pre-Cleaning: Remove oil and grease prior to mechanical cleaning as hereinafter specified by methods outlined in SSPC-SP 1 "Solvent Cleaning."

3.3 SURFACE PREPARATION

- A. Shop-Coated Ferrous Metal: Thoroughly degrease surfaces and clean using solvent (SSPC-SP 1). Remove loose rust, blistered and peeling paint to bare metal by scraping, sanding, wire brushing, or other abrasion methods in accordance with SSPC-SP 2 or SP 3; feather edges of adjacent sound paint. Dull glossy surfaces by scuff-sanding and wipe down. Spot-prime all abraded portions, rust areas, and bare surfaces with specified primer on same day of surface preparation. Finish prime after spot priming has dried thoroughly.

3.4 CLEANING PRIOR TO PAINTING

- A. Remove dust and loose deleterious materials from all surfaces before beginning painting operations. Program the cleaning and painting so that dust and other contaminants from the cleaning process will not fall in wet, newly painted surfaces.

3.5 APPLICATION OF PAINT

- A. Mixing: Mix paint materials in accordance with the manufacturer's instructions and directions. Mix often enough during application to keep the paint uniform and to ensure complete dispersion of pigment and a uniform composition.
 - 1. Prepare multiple component coatings using all of the contents of the container for each component as packaged by the manufacturer. Mixing of partial kits will not be permitted. Multiple component coatings that have been mixed shall not be used beyond their pot life. Only the components specified and furnished by the manufacturer, including thinner if required, shall be mixed.
- B. Application: Apply paint in accordance with the manufacturer's directions. Use techniques best suited for substrate and type of material being applied. Brushes and rollers shall be of a type best suited for the type of material being applied.
 - 1. Apply intermediate and finish coats within the manufacturer's recommended top coating time periods.
 - 2. When applying paint to drywall, use a roller nap no greater than 3/8 inch so as to achieve a light stipple finish.
 - 3. Brush and level out paint applied to metal door frames to achieve a nearly sprayed-on appearance.
 - 4. If metal doors are not sprayed, finish may be applied with 1/4 inch nap roller.
- C. Apply each coat of paint as a continuous film of uniform thickness, free from holidays, sags, crawls, pinholes, blisters, unevenness in color, or other evidence of poor workmanship. Repaint thin spots or areas missed in the application and allow to dry before applying next coat of paint.
 - 1. Give special attention to ensure that surfaces, such as edges, corners, crevices, welds and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

2. Each coat shall be free of dirt, dust, moisture, etc., prior to application of next coat.
- D. Allow each coat of paint to thoroughly dry, full thickness of the film, before application of the succeeding coat. Paint is considered dry for recoating when the next coat can be applied without the development of any detrimental film irregularities such as wrinkling, lifting, or loss of adhesion of the previous coat.
- E. Coverage for each paint material is specified as either the total minimum dry film thickness in mils, or the spreading rate in square feet per gallon over the surface designated. Actual coverage rate will vary depending upon the texture and porosity of the surface, climatic conditions, etc.
 1. The number of coats specified is the minimum required, irrespective of the coating thickness.
 2. In the event the required paint thickness is not achieved, apply additional coats until the required thickness is obtained.
 3. Do not exceed manufacturer's recommended maximum film build-up per coat (wet mils).
- F. Make edges of paint adjoining other materials or colors clean and sharp with no overlapping.
- G. Do not paint over any code-required labels or any equipment identification or nomenclature plates.
- H. Tops and bottoms of metal doors shall be finished the same as the faces (primed and two finish coats of painted).

3.6 DAMAGED PAINT SURFACES

- A. General: Before final acceptance of the work by the Architect, repair or re-finish painted surfaces which have been damaged at no additional cost. Refinish whole wall where portion of finish is not acceptable.

3.7 CLEAN-UP

- A. General: During the progress of the work, remove from the project all discarded paint materials, rubbish, cans and rags. Leave premises clean and in orderly condition.
- B. Cleaning: Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

3.8 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- B. Remove temporary protective wrappings after completing painting operations.

END OF SECTION 099000

DIVISION 26
ELECTRICAL

PART 1 – GENERAL

1.1 DESCRIPTION

- A. The General and Supplementary Conditions are a part of the requirements for the work under this Division of the Specifications.

1.2 WORK INCLUDED

- A. Provide labor and materials required to install, test and place into operation the electrical systems as called for in the Contract Documents, and in accordance with applicable codes and regulations.
- B. Provide labor, materials, and accessories required to provide complete, operating electrical systems. Labor, materials or accessories not specifically called for in the Contract Documents, but required to provide complete, operating electrical systems shall be provided without additional cost to the Owner.

1.3 QUALITY ASSURANCE

- A. Comply with the current applicable codes, ordinances, and regulations of the authority or authorities having jurisdiction, the rules, regulations and requirements of the utility companies serving the project and the Owner's insurance underwriter.
- B. Drawings, specifications, codes and standards are minimum requirements. Where requirements differ, the most stringent apply.
- C. Should any change in drawings or specifications be required to comply with governing regulations, notify the Architect prior to submitting bid.
- D. All electrical equipment, materials, devices and installations shall meet or exceed minimum requirements of ADA, ANSI, ASTM, IEEE, IES, NEC, NEMA, NETA, NFPA, OSHA, SMACNA, UL, and the State Fire Marshal.
- E. Execute work in strict accordance with the best practices of the trades in a thorough, substantial, quality conscious, worker like manner by competent workpeople. Provide a competent, experienced, full-time Superintendent who is authorized to make decisions on behalf of the Contractor.
- F. Equipment shall be certified for use in the State of the project and shall meet the State energy code.

1.4 ABBREVIATIONS AND DEFINITIONS

- A. Abbreviations:
 - 1. ADA Americans with Disabilities Act
 - 2. ANSI American National Standards Institute
 - 3. ASA Acoustical Society of America
 - 4. ASTM American Society for Testing and Materials

- 5. BIL Basic Impulse Level
- 6. CBM Certified Ballast Manufacturers
- 7. ECC Engineer's Control Center
- 8. EIA Electronic Industries Alliance
- 9. ETL Electrical Testing Laboratories, Inc.
- 10. FCC Fire Control Center
- 11. FM Factory Mutual
- 12. IEEE Institute of Electrical and Electronic Engineers
- 13. IES Illuminating Engineering Society
- 14. IPCEA International Power Cable Engineers Association
- 15. LED Light Emitting Diode
- 16. NEC National Electric Code
- 17. NEMA National Electrical Manufacturers Association
- 18. NETA National Electrical Testing Association
- 19. NFPA National Fire Protection Association
- 20. OEM Original Equipment Manufacturer
- 21. OSHA Occupational Safety and Health Administration
- 22. SCC Security Control Center
- 23. SMACNA Sheet Metal and Air Conditioning Contractors National Association
- 24. TIA Telecommunications Industry Association
- 25. UL Underwriters Laboratories

B. Definitions:

- 1. Where it is stated in these specifications to submit to Engineer for review, refer to Architectural General and Supplementary Conditions for proper procedures.
- 2. FURNISH means to supply all materials, labor, equipment, testing apparatus, controls, tests, accessories and all other items customarily required for the proper and complete application.
- 3. INSTALL means to join, unit, fasten, link, attach, set up or otherwise connect together before testing and turning over to Owner, complete and ready for regular operation.
- 4. PROVIDE means to FURNISH and INSTALL.
- 5. AS DIRECTED means as directed by the Architect, or the Architect's representative.
- 6. CONCEALED means embedded in masonry or other construction, installed behind wall furring or within drywall partitions, or installed within hung ceilings.
- 7. SUBMIT means submit to Architect for review.

1.5 GUARANTEE

- A. Submit a single guarantee stating that the work is in accordance with the Contract Documents. Guarantee work against faulty and improper material and workmanship for a period of one year from the date of final acceptance by the Owner, except that where guarantees or warranties for longer terms are provided or specified herein, the longer term shall apply. Correct any deficiencies, which occur during the guarantee period, within 24 hours of notification, without additional cost to the Owner, to the satisfaction of the Owner. Obtain similar guarantees from subcontractors, manufacturers, suppliers and subtrade specialists.

1.6 USE OF THE ARCHITECT'S AND ENGINEER'S DRAWINGS

- A. The Contractor shall obtain, at the Contractor's expense, from the Architect or Engineer a set of AutoCad or compatible format architectural and engineering drawings on electronic media where desired by the Contractor and/or required by the Specifications for use in preparing the shop drawings, coordination drawings, and record drawings. The Contractor shall provide to the Architect and Engineer a written release of liability acceptable to the Architect and Engineer prior to receiving the electronic media.

PART 2 – PRODUCTS

1.7 EQUIPMENT AND MATERIALS

- A. Provide products and materials that are new, clean, free of defects, and free of damage and corrosion.
- B. Products and materials shall not contain asbestos, PCB, or any other material that is considered hazardous by the Environmental Protection Agency or any other authority having jurisdiction.
- C. Replace materials of less than specified quality and relocate work incorrectly installed as directed by the Architect at no additional cost to the Owner.
- D. Provide name/data plates on major components of equipment with manufacturer's name, model number, serial number, capacity data and electrical characteristics attached in a conspicuous place.
- E. Install materials and equipment with qualified trades people.
- F. Maintain uniformity of manufacturer for equipment used in similar applications and sizes.
- G. Fully lubricate equipment where required.
- H. Follow manufacturer's instructions for installing, connecting, and adjusting equipment. Provide a copy of such instructions at the equipment during installation.
- I. Where factory testing of equipment is required to ascertain performance, and attendance by the Owner's representative is required to witness such tests, associated travel costs and subsistence shall be paid for by the Contractor.
- J. Equipment capacities, ratings, etc., are scheduled or specified for job site operating conditions. Equipment sensitive to altitude shall be derated with the method of derating identified on the submittals.
- K. Enclosures for electrical equipment installed in mechanical equipment rooms shall be NEMA type 1 gasketed. Enclosures for electrical equipment installed outdoors shall be NEMA type 3R.
- L. Energy consuming equipment shall be certified for use in the State of the project and shall meet the State Energy Code and local energy ordinances.

1.8 SUBSTITUTIONS

- A. Contract Documents are based on equipment manufacturers as called out in the Specifications and indicated on the Drawings. Acceptance of substitute equipment

manufacturers does not relieve Contractor of the responsibility to provide equipment and materials, which meet the performance as, stated or implied in the Contract Documents.

- B. Submit proposals to provide substitute materials or equipment, in writing, with sufficient lead time for review prior to the date equipment must be ordered to maintain project schedule. Reimburse Owner for costs associated with the review of the proposed substitution whether substitution is accepted or rejected.
- C. Indicate revisions required to adapt substitutions including revisions by other trades. Substitutions that increase the cost of the work and related trades are not permitted.
- D. The proposed substitution shall conform to the size, ratings, and operating characteristics of the equipment or systems as specified and shown on the Drawings.
- E. Proposals for substitutions shall include the following information:
 - 1. A description of the difference between the Contract Document requirements and that of the substitution, the comparative features of each, and the effect of the change on the end result performance. Include the impact of all changes on other contractors and acknowledge the inclusion of additional costs to the other trades.
 - 2. Schematic drawings and details.
 - 3. List of revisions to the Contract Documents that must be made if the substitution is accepted.
 - 4. Estimate of costs the Owner may incur in implementing the substitution, such as test, evaluation, operating and support costs.
 - 5. Statement of the time by which a Contract modification accepting the substitution must be issued, noting any effect on the Contract completion time or the delivery schedule.
 - 6. A statement indicating the reduction to the Contract price if the Owner accepts the substitution. Include required modifications to all related trades.

PART 3 – EXECUTION

1.9 FEES AND PERMITS

- A. Pay all required fees and obtain all required permits related to the electrical installation.
- B. Pay royalties or fees in connection with the use of patented devices and systems.
- C. Provide controlled inspection where required by authorities having jurisdiction or by these specifications.
- D. Contractor is responsible for paying for all utility shutdown and/or startup fees associated with electrical installation within the contract scope of work.

1.10 SUBMITTALS AND REVIEWS

- A. Submit shop drawings, manufacturer's product data sheets, samples, and test reports as specified.
- B. Within two months after notice to proceed by the Owner or Owner's Representative, or after execution of Owner/Contractor Agreement, submit a complete typed list of all

electrical equipment manufacturers and material suppliers for the equipment proposed to be provided on this project, as well as names of all subcontractors.

- C. Within four months after notice to proceed by the Owner or Owner's Representative, or after execution of Owner/Contractor Agreement, prepare an index of all submittals for the project. Include a submittal identification number, a cross-reference to the Specification sections or Drawing number, and an item description. Prefix the submittal identification number by the Specification sections to which they apply. Indicate on each submittal, the submittal identification number in addition to the other data specified. All subcontractors shall utilize the assigned submittal identification number.
- D. After the Contract is awarded, obtain complete shop drawings, product data and samples from the manufacturers, suppliers, vendors, and all subcontractors, for all materials and equipment as specified. Submit data and details of such materials and equipment for review. Prior to submission, certify that the shop drawings, product data and samples are in compliance with the Contract Documents. Check all materials and equipment upon their arrival on the job site and verify their compliance with the Contract Documents. Modify any work, which proceeds prior to receiving accepted shop drawings as required to comply with the Contract Documents and the shop drawings.
- E. Review of submittals is for general compliance with the design concept and Contract Documents. Comments or absence of comments shall not relieve the Contractor from compliance with the Contract Documents. The Contractor remains solely responsible for details and accuracy, for confirming and correlating all quantities and dimensions, for selecting fabrication processes, for techniques of construction, for performing the work in a safe manner, and for coordinating the work with that of other trades.
- F. No part of the work shall be started in the shop or in the field until the shop drawings and samples for that portion of the work have been submitted and accepted.
- G. A minimum period of ten working days, exclusive of transmittal time, will be required in the Engineer's office each time a shop drawing, product data and/or samples are submitted for review. This time period must be considered by the Contractor in the scheduling of the work.
- H. Submit electronic copies of all items requiring shop drawings. Submit electronic copies of manufacturer's product submittals. Electronic copies of submittals, with applicable markups, will be returned. Additional copies are the responsibility of the Contractor.
- I. Submittals will be stamped as follows:

Stamp	Interpretation
No Exceptions Noted	Fabrication, manufacture, or construction may proceed providing submittal complies with the Contract Documents.
Exceptions Noted [] Resubmit for Record [] No Resubmission Required	Fabrication, manufacture, or construction may proceed providing submittal complies with the Contract Documents and the Engineer's notations.
Revise and Resubmit	Submittal does not comply with the Contract Documents. Do not proceed with fabrication,

	manufacture, or construction. The work and/or shop drawings are not permitted at the job site. Revise and resubmit submittal.
Reviewed for Information Only	Reyes Engineering, Inc. did not take part designing the system associated with this submittal. Reyes Engineering, Inc. has reviewed this submittal at the request of the project Architect and/or facility owner for information only. The submittal has not been reviewed for conformance with any contract document produced under the supervision of Reyes Engineering, Inc. Any comments provided below are for general coordination or feedback purposes to the contractor or engineer of record.
Unreviewed	Submittal has not been reviewed.

- J. Submit materials and equipment by manufacturer, trade name, and model number. Include copies of applicable brochure or catalog material. Maintenance and operating manuals are not acceptable substitutes for shop drawings.
- K. Identify each sheet of printed submittal pages (using arrows, underlining or circling) to show applicable sizes, types, model numbers, ratings, capacities and options actually being proposed. Cross out non-applicable information. Note specified features such as materials or paint finishes.
- L. Include dimensional data for roughing in and installation and technical data sufficient to verify that equipment meets the requirements of the Contract Documents. Include wiring, piping and service connection data.
- M. Maintain a complete set of reviewed and stamped shop drawings and product data on site.
- N. For each room or area of the building containing electrical equipment, submit the following:
 - 1. Floor Plans: Plan and elevation layout drawings indicating the equipment in the exact location in which it is intended to be installed. These plans shall be of a scale not less than ¼ inch = 1'-0". They shall be prepared in the following manner:
 - a. Indicate the physical boundaries of the space including door swings and ceiling heights and ceiling types (as applicable).
 - b. Illustrate all electrical equipment proposed to be contained therein. Include top and bottom elevations of all electrical equipment. The Drawings shall be prepared utilizing the dimensions contained in the individual equipment submittals. Indicate code and manufacturer's required clearances.
 - c. Illustrate all other equipment therein such as conduits, detectors, luminaries, ducts, registers, pull boxes, wireways, structural elements, etc.

- d. Indicate the operating weight of each piece of equipment.
 - e. Indicate the heat release from each piece of electrical equipment in terms of BTU per hour. This information shall be that which is supplied by the respective manufacturers.
 - f. Illustrate concrete pads, curbs, etc.
 - g. Indicate dimensions to confirm compliance with code-required clearances.
 - h. Indicate maximum normal allowable operating temperature for each piece of equipment (as per each respective manufacturer's recommendation).
 - i. Equipment removal routes.
- O. The work described in shop drawing submissions shall be carefully checked by all trades for clearances (including those required for maintenance and servicing), field conditions, maintenance of architectural conditions and coordination with other trades on the job. Each submitted shop drawing shall include a certification that related job conditions have been checked by the Contractor and each Subcontractor and that conflicts do not exist.
- P. The Contractor is not relieved of the responsibility for dimensions or errors that may be contained on submissions, or for deviations from the requirements of the Contract Documents. The noting of some errors but overlooking others does not grant the Contractor permission to proceed in error. Regardless of any information contained in the shop drawings, product data and samples, the Contract Documents govern the work and are neither waived nor superseded in any way by the review of shop drawings, product data and samples.
- Q. Inadequate or incomplete shop drawings, product data and/or samples will not be reviewed and will be returned to the Contractor for resubmittal.
- R. Number all pages and drawings in product data brochures consecutively from beginning to end. Unless the following information is included, the submittal will be returned for resubmission. Resubmittals of product data or brochures shall include a cover letter summarizing the corrections made in response to the review comments.
- 1. Indicate the following on the lower right hand corner of each shop drawing and on the coversheet of each product data brochure electronic submission:
 - a. The submittal identification number
 - b. Title of the sheet or brochure
 - c. Name and location of the project
 - d. Names of the Architect, Engineer, Contractor, Subcontractor, manufacturer, supplier, and vendor
 - e. The date of submittal; and the date of each correction, version and revision.
- S. The distribution equipment, short circuit and coordination study, and room layout submittals shall be submitted concurrently. Failure to submit concurrently may result in the immediate return of the submittal marked REVISE AND RESUBMIT.

1.11 COORDINATION OF WORK

- A. The Contract Documents establish scope, materials and quality but are not detailed installation instructions. Drawings are diagrammatic.

- B. Coordinate work with related trades and furnish, in writing, any information necessary to permit the work of related trades to be installed satisfactorily and with the least possible conflict or delay.
- C. The electrical drawings show the general arrangement of equipment and appurtenances. Follow these drawings as closely as the actual construction and the work of other trades will permit. Provide offsets, fittings, and accessories, which may be required but not shown on the Drawings. Investigate the site, and review drawings of other trades to determine conditions affecting the work, and provide such work and accessories as may be required to accommodate such conditions.
- D. The locations of lighting fixtures, outlets, panels and other equipment indicated on the Drawings are approximately correct, but they are understood to be subject to such revision as may be found necessary or desirable at the time the work is installed in consequence of increase or reduction of the number of outlets, or in order to meet field conditions, or to coordinate with modular requirements of ceilings, or to simplify the work, or for other legitimate causes.
- E. Exercise particular caution with reference to the location of panels, outlets, switches, etc., and have precise and definite locations accepted by the Architect before proceeding with the installation.
- F. The Drawings show only the general run of raceways and approximate locations of outlets. Any significant changes in location of outlets, cabinets, etc., necessary in order to meet field conditions shall be brought to the immediate attention of the Architect for review before such alterations are made. Modifications shall be made at no additional cost to the Owner.
- G. Verify with the Architect the exact location and mounting height of outlets and equipment not dimensionally located on the Drawings.
- H. Circuit tags in the form of numbers are used where shown to indicate the circuit designation numbers in electrical panels. Show the actual circuit numbers on the as-built Record Drawings and on the associated typed panelboard directory card. Where circuiting is not indicated, provide required circuiting in accordance with the loading indicated on the Drawings and/or as directed.
- I. The Drawings generally do not indicate the number of wires in conduit for the branch circuit wiring of fixtures and outlets, or the actual circuiting. Provide the correct wire size and quantity as required by the indicated circuiting and/or circuit numbers indicated, the control intent, referenced wiring diagrams (if any), the specified voltage drop or maximum distance limitations, and the applicable requirements of the NEC.
- J. Carefully check space requirements with other trades to insure that equipment can be installed in the spaces allotted.
- K. Wherever work interconnects with work of other trades, coordinate with other trades to insure that they have the information necessary so that they may properly install the necessary connections and equipment. Identify items (remote ballast, pull boxes, etc.) requiring access in order that the ceiling trade will know where to install access doors and panels.

- L. Consult with other trades regarding equipment so that, wherever possible, motor controls and distribution equipment are of the same manufacturer.
- M. Furnish and set sleeves for passage of electrical risers through structural masonry and concrete walls and floors and elsewhere as required for the proper protection of each electrical riser passing through building surfaces.
- N. Provide firestopping around all pipes, conduits, ducts, sleeves, etc. which pass through rated walls, partitions and floors.
- O. Provide detailed information on openings and holes required in precast members for electrical work.
- P. Provide required supports and hangers for conduit and equipment, designed so as not to exceed allowable loadings of structures.
- Q. Examine and compare the Contract Documents with the drawings and specifications of other trades, and report any discrepancies between them to the Architect and obtain written instructions for changes necessary in the work. Install and coordinate the work in cooperation with other related trades. Before installation, make proper provisions to avoid interferences.
- R. Wherever the work is of sufficient complexity, prepare additional detail drawings to scale to coordinate the work with the work of other trades. Detailed work shall be clearly identified on the Drawings as to the area to which it applies. Submit these drawings to the Architect for review. At completion include a set of these drawings with each set of Record Drawings.
- S. Furnish services of an experienced Superintendent, who shall be in constant charge of all work, and who shall coordinate work with the work of other trades. No work shall be installed before coordinating with other trades.
- T. Coordinate with the local electric utility company and the local telephone company as to their requirements for service connections and provide all necessary metering provisions, grounding, materials, equipment, labor, testing, and appurtenances. Coordinate the electrical service installation with the Utility Company, contractor shall be responsible for all work related to the service that is not provided by the Utility. Coordinate with the owner's representative to arrange the existing building incoming service shutdown at least 4 weeks prior to commence,
- U. Before commencing work, examine adjoining work on which this work is in any way affected and report conditions, which prevent performance of the work. Become thoroughly familiar with actual existing conditions to which connections must be made or which must be changed or altered.
- V. Adjust location of conduits, panels, equipment, etc., to accommodate the work to prevent interferences, both anticipated and encountered. Determine the exact route and location of each conduit prior to fabrication.
 - 1. Right-of-Way: Lines which pitch have the right-of-way over those which do not pitch. For example: condensate, steam, and plumbing drains normally have right-of-way. Lines whose elevations cannot be changed have right-of-way over lines whose elevations can be changed.

2. Provide offsets, transitions and changes in direction of conduit as required to maintain proper headroom and pitch on sloping lines.
- W. In cases of doubt as to the work intended, or in the event of need for explanation, request supplementary instructions from the Architect.
- X. Prepare detailed layout drawings for panel layouts in electric rooms or closets, utilizing dimensioned shop drawing data of equipment to be furnished. Provide additional wiring details at switchboards, motor control centers, and other areas where work is of sufficient complexity to warrant additional detailing for coordination. Submit layout drawings for approval prior to commencing field installation and shall be included with shop drawings.
- Y. Coordinate underground work with other contractors working on the site. Particular coordination shall be performed with contractors installing storm sewer, sanitary sewer, gas, water and irrigation lines to avoid conflicts. Common trenches may be used with other trades, providing clearances required by codes and ordinances are maintained.

1.12 CONTRACTOR'S COORDINATION DRAWINGS

- A. The Contractor shall coordinate efforts of all trades and shall furnish (in writing, with copies to the Architect) any information necessary to permit the work of all trades to be installed satisfactorily and with the least possible interference or delay.
- B. The Contractor and all trade contractors shall prepare a complete set of construction Coordination Drawings indicating the equipment actually purchased and the exact routing for all lines such as busway, conduit, piping, ductwork, etc., including conduit embedded in concrete floors and walls. The Coordination Drawings shall be submitted complete to the Architect and the Engineer, within three months after notice to proceed is given, and in compliance with the construction schedule for the project. The sheet metal drawings, at a scale of not less than 1/4 inch to 1 foot, shall serve as the base drawings to which all other Contractors shall add their work. Each separate trade contractor shall draw their work on separate layers with different color assignments to facilitate coordination. Each Coordination Drawing shall be completed and signed off by the other Trade Contractors and the Contractor prior to the installation of the HVAC, plumbing, electrical and fire sprinkler work in the area covered by the specific drawing. The Contractor's work shall be installed according to the shop drawings and coordination drawings. If the Contractor allows one trade to install their work before coordination with the work of other trades, the Contractor shall make all necessary changes to correct the condition at no additional cost to the Owner.
- C. The Contractors' Coordination Drawings shall indicate structural loads at support points for all piping 10 inch and larger, racked piping, racked conduit, busway, and suspended electrical equipment. Submit to Structural Engineer for review and approval. The elevation, location, support points, static, dynamic and expansion forces and loads imposed on the structure at support and anchor points shall be indicated. All beam penetrations and slab penetrations shall be indicated and sized and shall be coordinated. Work routed underground or embedded in concrete shall be indicated by dimension to column and building lines and shall be coordinated. Coordination Drawings shall document all required structural penetrations for initial construction. Penetrations shall be dimensioned for walls, floors and roofs. These structural coordination requirements require review and approval by the Structural Engineer prior to completion and submittal of the drawings.

- D. This requirement for Coordination Drawings shall not be construed as authorization for the Contractor or trade contractors to make any unauthorized changes to the Contract Documents. Contract document space allocations shall be maintained such as ceiling height, designated clearance for future construction and flexibility, chase walls, equipment room size, unless prior written authorization is received from the Architect to change them.
- E. Prior to final acceptance of the Work the Contractor shall submit the Coordination Drawings as part of the Record Drawings submittal.

1.13 EQUIPMENT CONNECTIOS:

- A. Provide complete electrical connections for all items of equipment requiring such connections, including incidental wiring, materials, devices, and labor necessary for a finished working installation and in compliance with manufacturer's installation instructions based on Minimum Circuit Amps, Maximum Overcurrent Protection (breaker or fuse size), Full Load Amps, and horse power/KVA/KWA rating.
- B. Verify the location and method for connecting to each item of equipment prior to roughing-in. Check the voltage and phase of each item of equipment before connecting.
- C. Make motor connections for the proper direction of rotation. Minimum size flex for mechanical equipment shall be 1/2 inch except at small control devices where 3/8-inch flex may be used. Exposed motor wiring shall be jacketed metallic flex with 6 inches minimum slack loop. Pump motors shall not be test run until liquid is in the system.
- D. Control devices and wiring relating to the HVAC systems will be furnished and installed under Division 23, 24 and 35 except for provisions or items specifically noted on the electrical Drawings or specified herein.

1.14 EXAMINATION OF SITE

- A. Prior to the submitting of bids, visit the project site and become familiar with all conditions affecting the proposed installation and make provisions as to the cost thereof.
- B. The Contract Documents do not make representations regarding the character or extent of the sub-soils, water levels, existing structural, mechanical and electrical installations, above or below ground, or other sub-surface conditions which may be encountered during the work. Evaluate existing conditions, which may affect methods or cost of performing the work, based on examination of the site or other information. Failure to examine the Drawings or other information does not relieve the Contractor of responsibility for the satisfactory completion of the work.

1.15 EXCAVATION AND BACKFILL

- A. Provide excavation for the work of this Division. Excavate all material encountered, to the depths indicated on the Drawings or as required. Remove from the site excavated materials not required or suitable for backfill. Provide grading as may be necessary to prevent surface water from flowing into trenches or other excavations. Remove any water, which accumulates. Provide sheeting and shoring as may be necessary for the protection of the work and for the safety of personnel.

- B. Provide trenches of widths necessary for the proper execution of the work. Grade bottom of the trenches accurately to provide uniform bearing and support the work on undisturbed soil at every point along its entire length. Except where rock is encountered, do not excavate below the depths indicated. Where rock excavations are required, excavate rock to a minimum overdepth of four inches below the trench depths indicated on the Drawings or required. Backfill overdepths in the rock excavation and unauthorized overdepths with loose, granular, moist earth, thoroughly machine tamped to a compaction level of at least 95% to standard proctor density or 75% relative density or as specified by the Architect. Whenever unstable soil that is incapable of properly supporting the work is encountered in the bottom of the trench, remove soil to a depth required and backfill the trench to the proper grade with coarse sand, fine gravel or other suitable material.
- C. Excavate trenches for utilities that will provide the following minimum depths of cover from existing grade or from indicated finished grade, whichever is lower, unless otherwise specifically shown.

Coordinate burial depths with civil engineer, serving utilities, and local codes.

 - 1. Electric service: 2 feet minimum.
 - 2. Telephone service: 2 feet minimum.
- D. Trenches should not be placed within ten feet of foundation or soil surfaces, which must resist horizontal forces.
- E. Do not backfill trenches until all required tests have been performed and installation observed by the Architect. Comply with the requirements of other sections of the Specifications. Backfill shall consist of non-expensive soil with limited porosity. Deposit in 6 layers and thoroughly and carefully tamp until the work has a cover of not less than 1 foot. Backfill and tamp remainder of trench at 1 foot intervals until complete. Uniformly grade the finished surface.

1.16 CUTTING AND PATCHING

- A. Where cutting, channeling, chasing or drilling of floors, walls, partitions, ceilings or other surfaces is necessary for the proper installation, support or anchorage of conduit or other equipment, layout the work carefully in advance. Repair any damage to the building, piping, equipment or defaced finished plaster, woodwork, metalwork, etc., using skilled tradespeople of the trades required at no additional cost to the Owner.
- B. Do not cut, channel, chase or drill unfinished masonry, tile, etc., unless permission from the Architect is obtained. If permission is granted, perform this work in a manner acceptable to the Architect.
- C. Where conduit or equipment are mounted on a painted finished surface, or a surface to be painted, paint to match the surface. Cold galvanize bare metal whenever support channels are cut.
- D. Provide slots, chases, openings and recesses through floors, walls, ceilings, and roofs as required. Where these openings are not provided, provide cutting and patching to accommodate penetrations at no additional cost to the Owner.

1.17 MOUNTING HEIGHTS

- A. Mounting heights shall conform to ADA requirements.
- B. Verify exact locations and mounting heights with the Architect before installation.
- C. Electrical and telecommunications outlets shall be mounted not lower than 15 inches above finished floor to bottom of outlet and not higher than 48 inches above finished floor to top of device.
- D. Electrical switches shall be mounted not lower than 36 inches above finished floor to center of switch and not higher than 48 inches above finished floor to center of switch.
- E. Fire alarm manual pull stations shall be mounted 48 inches above finished floor to center of manual pull station.
- F. Outlets for public and other wall mounted type telephones shall be installed so that the particular telephone installed conforms to ADA mounting height requirements.
- G. Visual Alarms: Mount not less than 80 inches to the bottom or 96 inches to the top of the device.
- H. Wall Mounted Exit Signs: 2 inches above top of door to bottom of sign.
- I. Low Level Exit Signs: 6 inches to bottom of sign.
- J. Stairwell and utility corridor wall mounted lighting fixtures shall be mounted 8 feet 6 inches above finished floor or 1 foot below ceiling or structure above, whichever is lower.

1.18 CONTINUANCE OF EXISTING SERVICES

- A. Existing electrical services not specifically indicated to be removed or altered shall remain as they presently exist.
- B. Where existing services interfere with new construction, alter or reroute such existing equipment to facilitate new construction after obtaining written permission from the Architect. Notification in writing giving two weeks advance notice of planned alteration is required.
- C. Preserve continuity of service of existing facilities (related to damage or alteration due to new construction). Unauthorized alteration to existing equipment shall be corrected without additional cost to the Owner.

1.19 DEMOLITION

- A. Remove, relocate, and reroute existing electrical equipment to facilitate new construction or remodeling work.
- B. Examine the site before submitting a bid to observe existing conditions.
- C. Schedule demolition in advance. Schedule work to avoid disruption of normal operations.
- D. Reconnect circuits serving equipment required to remain in service to other panelboards, motor control centers, or other appropriate distribution equipment. Provide additional

panelboards, motor control centers, or other appropriate distribution equipment where there is insufficient available capacity in remaining existing equipment for reconnection.

- E. Remove existing conduit and wire back to panelboard, motor control center, or other distribution source.
- F. Where a circuit is interrupted by removal of a device or fixture from that circuit, provide additional conduit and wire to restore service to the remaining devices and fixtures on that circuit.
- G. Electrical equipment to be removed that is in good working order shall be carefully removed and offered to the Owner. Items rejected by the Owner shall be removed from the project site and properly disposed of.

1.20 CLEANING UP

- A. Avoid accumulation of debris, boxes, loose materials, crates, etc., resulting from the installation of this work. Remove from the premises each day all debris, boxes, etc., and keep the premises clean and free of dust and debris.
- B. Clean all fixtures and equipment at the completion of the project. Wipe clean exposed lighting fixture reflectors and trim pieces with a non-abrasive cloth just prior to occupancy.
- C. All electrical equipment shall be thoroughly vacuumed and wiped clean prior to energization and at the completion of the project. Equipment shall be opened for observation by the Architect as required.

1.21 WATERPROOFING

- A. Avoid, if possible, the penetration of any waterproof membranes such as roofs, machine room floors, basement walls, and the like. If such penetration is necessary, make penetration prior to the waterproofing and furnish all sleeves or pitch-pockets required. Advise the Architect and obtain written permission before penetrating any waterproof membrane, even where such penetration is shown on the Drawings.
- B. Restore waterproofing integrity of walls or surfaces after they have been penetrated without additional cost to the Owner.

1.22 SUPPORTS

- A. Support work in accordance with the best industry practice. Provide supports, hangers, auxiliary structural members and supplemental hardware required for support of the work.
- B. Provide supporting frames or racks extending from floor slab to ceiling slab for work indicated as being supported from walls where the walls are incapable of supporting the weight. In particular, provide such frames or racks in electric closets and mechanical equipment rooms.
- C. Provide supporting frames or racks for equipment, which is installed in a freestanding position.
- D. Supporting frames or racks shall be of standard angle, standard channel or specialty support system steel members, rigidly bolted or welded together and adequately braced

to form a substantial structure. Racks shall be of ample size to assure a workmanlike arrangement of all equipment mounted on them.

- E. Adequate support of equipment (including outlet, pull and junction boxes and fittings) shall not depend on electric conduits, raceways, or cables for support.
- F. Electrical equipment shall not rest on or depend for support on suspended ceiling media (tiles, lath, plaster, as well as splines, runners, bars and the like in the plane of the ceiling). Provide independent support of electrical equipment. Do not attach to supports provided for ductwork, piping or work of other trades.
- G. Provide required supports and hangers for conduit, equipment, etc., so that loading will not exceed allowable loadings of structure. Electrical equipment and supports shall not come in contact with work of other trades.

1.23 FASTENINGS

- A. Fasten equipment to building structure in accordance with the best industry practice.
- B. Where weight applied to the attachment points is 100 pounds or less, conform to the following as a minimum:
 - 1. Wood: Wood screws.
 - 2. Concrete and solid masonry: Bolts and expansion shields.
 - 3. Hollow construction: Toggle bolts.
 - 4. Solid metal: Machine screws in tapped holes or with welded studs.
 - 5. Steel decking or sub-floor: Fastenings as specified below for applied weights in excess of 100 pounds.
- C. Where weight applied to building attachment points exceeds 100 pounds, but is 300 pounds or less, conform to the following as a minimum:
 - 1. At concrete slabs provide 24 inch x 24 inch x ½ inch steel fishplates on top with through bolts. Fishplate assemblies shall be chased in and grouted flush with the top of slab screed line, where no fill is to be applied.
 - 2. At steel decking or sub-floor for all fastenings, provide through bolts or threaded rods. The tops of bolts or rods shall be set at least one inch below the top fill screed line and grouted in. Suitable washers shall be used under bolt heads or nuts. In cases where the decking or sub-floor manufacturer produces specialty hangers to work with their decking or sub-floor such hangers shall be provided.
- D. Where weight applied to building attachment points exceeds 300 pounds, coordinate with and obtain the approval of Architect and conform to the following as a minimum:
 - 1. Provide suitable auxiliary channel or angle iron bridging between building structural steel elements to establish fastening points. Bridging members shall be suitably welded or clamped to building steel. Provide threaded rods or bolts to attach to bridging members.
- E. For items, which are shown, as being ceiling mounted at locations where fastening to the building construction element above is not possible, provide suitable auxiliary channel or angle iron bridging tying to the building structural elements.

- F. Wall mounted equipment may be directly secured to wall by means of steel bolts. Groups or arrays of equipment may be mounted on adequately sized steel angles, channels, or bars. Prefabricated steel channels as manufactured by Kindorf or Unistrut are acceptable.

1.24 IDENTIFICATION

- A. Identify electrical equipment with permanently attached black phenolic nameplates with $\frac{1}{2}$ inch high white engraved lettering. Identification shall include equipment name or load served as appropriate. Nameplates for equipment connected to the emergency power system shall be red with white lettering. Nameplates shall be attached with cadmium plated screws; peel and stick tape or glue on type nameplates are not allowed.
- B. Cable tags shall be flameproof secured with flameproof non-metallic cord.
- C. Provide an engraved nameplate for each switch controlling loads, which are not local to the switch.
- D. Wherever raceways for future use are terminated outside of the building, stake the location with a 2 foot long, 1 inch x 1 inch clear heart redwood stake.
- E. See individual sections for additional identification requirements.

1.25 PROHIBITED LABELS AND IDENTIFICATIONS

- A. In all public areas, tenant areas, and similar locations within the project, the inclusion or installation of any equipment or assembly which bears on any exposed surface any name, trademark, or other insignia which is intended to identify the manufacturer, the vendor, or other source(s) from which such object has been obtained, is prohibited.
- B. Required UL labels shall not be removed nor shall identification specifically required under the various technical sections of the Specifications be removed.

1.26 EQUIPMENT PADS AND ANCHOR BOLTS

- A. Provide concrete pads under all floor mounted electrical equipment. Equipment pads shall conform to the shape of the piece of equipment it serves with a minimum 1 inch margin around the equipment and supports. Pads shall be a minimum of 4 inches high and made of a minimum 28 day, 2500psi concrete reinforced with 6 inch x 6 inch 6/6 gauge welded wire mesh. Trowel tops and sides of pad to smooth finishes, equal to those of the floors, with all external corners bullnosed to a $\frac{3}{4}$ inch radius. Shop drawings stamped NO EXCEPTIONS NOTED shall be used for dimensional guidance in sizing pads.
- B. Provide galvanized anchor bolts for all equipment placed on concrete equipment pads, inertia blocks, or on concrete slabs. Provide bolts of the size and number recommended by the manufacturer of the equipment and locate by means of suitable templates. Equipment installed on vibration isolators shall be secured to the isolator. Secure the isolator to the floor, pad, or support as recommended by the vibration isolation manufacturer.
- C. Where equipment is mounted on gypsum board partitions, the mounting screws shall pass through the gypsum board and securely attach to the partition studs. As an

alternative, the mounting screws may pass through the gypsum board and be securely attached to 6 inches square, 18 gauge galvanized metal backplates, which are attached to the gypsum board with an approved non-flammable adhesive. Toggle bolts installed in gypsum board partitions are not allowed.

1.27 DELIVERY, DRAYAGE AND HAULING

- A. Provide drayage, hauling, hoisting, shoring and placement in the building of equipment specified and be responsible for the timely delivery and installation of equipment as required by the construction schedule. If any item of equipment is received prior to the time that it is required, the Contractor shall be responsible for its proper storage and protection until the time it is required. Pay for all costs of drayage or storage.
- B. If equipment is not delivered or installed at the project site in a timely manner as required by the project construction schedule, the Contractor shall be responsible for resulting disassembly, re-assembly, manufacturer's supervision, shoring, general construction modification, delays, overtime costs, etc. at no additional cost to the Owner.

1.28 EQUIPMENT AND MATERIAL PROTECTION

- A. Protect the work, equipment, and material of other trades from damage by work or workmen of this trade, and correct damaged caused without additional cost to the Owner.
- B. Take responsibility for work, materials, and equipment until finally inspected, tested and accepted. Protect work against theft, injury, or damage, and carefully store material and equipment received on site, which is not immediately installed. Close open ends of work with temporary covers or plugs during construction to prevent entry of obstructing material. Cover and protect equipment and materials from damage due to water, spray-on fireproofing, construction debris, etc. Store equipment to moisture damage in dry, heated spaces.
- C. Provided adequate means for fully protecting finished parts of materials and equipment against damage from whatever cause during the progress of the work until final acceptance. Protect materials and equipment in storage and during construction in such a manner that no finished surfaces will be damaged or marred, and moving parts are kept clean and dry. Do not install damaged items; take immediate steps to obtain replacement or repair.
- D. Lighting fixture troffers with parabolic reflectors shall be installed with factory mounted plastic protective bags around parabolic reflector assembly. Remove protective bag just prior to occupancy.

1.29 TESTING OF ELECTRICAL SYSTEMS

- A. Comply with the project construction schedule for the date of final performance and acceptance testing, and complete work sufficiently in advance of the Contract completion date to permit the execution of the testing prior to occupancy and Contract closeout. Complete any adjustments and/or alterations, which the final acceptance tests indicate as necessary for the proper functioning of all equipment prior to the completion date. See individual sections for extent of testing required.
- B. Provide a detailed schedule of completion indicating when each system is to be completed and outlining when field testing will be performed. Submit completion

schedule for review within six months after the notice to proceed by Owner's Representative has been given. Update this schedule periodically as the project progresses.

1.30 OPERATING INSTRUCTIONS

- A. Provide the services of factory trained specialists to provide an operating instructions seminar for equipment and systems. The seminar shall be conducted over a five day (consecutive) period. Instruction time is defined as straight time working hours and does not include nights, weekends, or travel time to and from the project.
- B. Submit seminar agenda, schedule and list of representatives to the Owner for approval thirty days prior to suggested date of seminar. Do not commence seminar until the Owner has issued a written acceptance of the starting time and attendees. Confirm attendance of seminar by written notification to participants.
- C. Instruct Owner's operating personnel in proper starting sequences, operation, shutdown, general maintenance and preventative maintenance procedures, including normal and emergency procedures.
- D. Submit final copies of Record Drawings and Operating and Maintenance Manuals to Owner at seminar.
- E. Submit a written record of minutes and attendees of the seminar to the Owner.

1.31 OPERATING AND MAINTENANCE MANUALS

- A. Provide Operating and Maintenance Manuals for equipment and materials furnished under this Division.
- B. Maintenance manuals shall include complete cleaning and servicing data compiled in a clear and easily understandable format. Show model numbers of each piece of equipment, complete lists of replacement parts, capacity ratings, and actual loads.
- C. Provide the following information where applicable:
 - 1. Identifying name and mark number.
 - 2. Locations (where several similar items are used, provide a list).
 - 3. Complete nameplate data.
 - 4. Certified Record Drawings and Final Reviewed submittals.
 - 5. Parts list.
 - 6. Performance curves and data.
 - 7. Wiring diagrams.
 - 8. Manufacturer's recommended operating and maintenance instructions with all non-applicable information deleted.
 - 9. List of spare parts recommended for normal service requirements.
 - 10. Assembly and disassembly instructions with exploded view drawings where necessary.
 - 11. Test reports.
 - 12. Trouble shooting diagnostic instructions where applicable.

- D. Submit electronic copies of operating and maintenance data books for review at least ten (10) weeks before the completion date. Assemble data in a completely indexed volume or volumes electronically as indicated for each item.

1.32 RECORD DRAWINGS

- A. The Contractor shall maintain on a daily basis at the Project site a complete set of Record Drawings. The Record Drawings shall initially consist of a set of blue-line prints or AutoCAD files of the Contractor's Coordination Drawings. The prints shall be marked or the AutoCAD files electronically updated to show the precise location of all buried or concealed work and equipment, including embedded conduit, raceways and boxes, and all changes and deviations in the Electrical work from that shown on the Contract Documents. This requirement shall not be construed as authorization for the Contractor to make changes in the layout or work without definite written instructions from the Architect or Engineer. The updated Coordination Drawings shall be used to produce the final Record Drawings that shall be delivered to the Owner in AutoCAD electronic format media upon Project completion.
- B. Record dimensions clearly and accurately to delineate the work as installed. Suitably identify locations of all equipment by at least two dimensions to permanent structures.
- C. The Contractor and Subcontractor shall mark all in-progress Record Drawings on the front lower right hand corner with a rubber stamp impression or an AutoCAD image similar to the following:

RECORD DRAWING
(3/8 inch high letters)
To be used for recording Field Deviations and Dimensional Data Only
(5/16 inch high letters)

- D. Upon completion of the work, the Contractor and subcontractors shall certify all Record Drawings on the front lower right hand corner adjacent to the above marking with a rubber stamp impression or an AutoCAD image similar to the following:

RECORD DRAWING

CERTIFIED CORRECT

(3/8 inch high letters)

(Printed Name of General Contractor)

(5/16 inch high letters)

Date:

(Printed Name of Subcontractor)

(5/16 inch high letters)

Date:

- E. Prior to final acceptance of the Work of this Division, the Contractor shall submit properly certified Record Drawings to the Architect and Engineer for review and shall make changes, corrections, or additions as the Architect and/or Engineer may require to the Record Drawings. After the Architect's and Engineer's review, and any required Contractor revisions, the Record Drawings shall be delivered to the Owner on electronic media in AutoCAD format. The Architect and Engineer do not assume any responsibility for the accuracy or completeness of the Record Drawings.

1.33 FINAL PUNCHLIST

- A. Prior to the Final Punchlist, certify that systems and equipment are complete, operational, and are in compliance with the Contract Documents.
- B. During the Final Punchlist, provide personnel with access keys, hand held radios, and necessary expertise to operate each system and piece of equipment to demonstrate operational compliance with the Contract Documents.
- C. Any deficiencies noted on the Final Punchlist shall be expeditiously corrected and certified in writing.

1.34 EARLY OCCUPANCY

- A. Complete those systems which are necessary to allow partial early occupancy of the building.
- B. Verify and comply with requirements for temporary occupancy with the local Building and Fire Departments.

END OF SECTION

PART 1 – GENERAL

1.1 WORK INCLUDED

- A. Conductor sizes are sized for copper and shall be considered minimum for ampacities and voltage drop requirements.
- B. Conductors for special systems shall be as recommended by the equipment manufacturer except as noted.
- C. Deliver conductors to the job site in cartons, protective covers, or on reels.
- D. The existing power distribution feeders are desired to be re-used where they can remain substantially undisturbed.
 - 1. The existing TW, (Polyvinylchloride) insulated copper conductors will be tested via megohmmeter testing to determine the existing insulation soundness.
 - 2. Tested and accepted feeder conductors will be intercepted and extended (where feasible) to re-energize new panels and power distribution systems.
 - 3. Compression barrel splices and new copper, THW insulated conductors will be used to extend and terminate the existing tested and accepted feeders.
 - 4. UL listed insulation kits will be used to insulate the splices.

1.2 SUBMITTALS

- A. Product data.
- B. Test reports.

PART 2 - PRODUCTS

2.1 CONDUCTORS - 600V

- A. Type:
 - 1. Copper: No. 12 AWG minimum size unless noted otherwise
 - 2. No. 8 and larger, Class B concentric or compressed stranded.
- B. Insulation:
 - 1. Thermal setting, polyvinyl chloride: THW, THHN, THWN unless noted or specified otherwise.
 - 2. Underground Installations: Cross linked polyethylene: XHHW-2
- C. Thru wiring in luminaires shall be rated for 90-degree C minimum.
- D. Manufacturers: General, Essex, Rome, Southwire, or approved equal.
- E. Color coding of conductors by system voltage is required:

1. For 120/208 Volt power systems, utilize: Black, Red and blue for phase conductors. Utilize white for neutral conductors. Utilize green for ground conductors.
 2. For 277/480 Volt power systems, utilize: Brown, Orange and yellow for phase conductors. Utilize gray for neutral conductors. Utilize green with a yellow stripe for ground conductors.
- F. Where a distinct color code system is currently in place, continue the current color code system.

2.2 POWER LIMITED WIRING

- A. Copper, stranded or solid as recommended by the system manufacturer.
- B. Insulation shall be appropriate for the system and location used.
- C. Provide pre-manufactured, UL listed and labeled cable supports.

2.3 CONNECTORS - 600V AND BELOW

- A. Branch Circuit Conductor Splices: Live spring type, Scotchlok, Ideal Wire Nut, Buchanan B-Cap, or 3M Series 560 self-stripping type.
- B. Cable Splices: Compression tool applied sleeves, Kearney, Burndy, or equal with 600V heat shrink insulation. For cable splices in sub-terrain/underground vaults or any wet locations shall be provided with 600V 3M Series DBR-6 or approved.
- C. Terminator Lugs for Stranded Wire:
 1. No. 10 Wire and Smaller: Spade flared, tool applied.
 2. No. 8 Wire and Larger: Compression tool applied, Burndy, Anderson, or equal. Set screw type terminator lugs supplied as an integral part of switches and circuit breakers will be acceptable for terminating only copper conductors.

PART 3 - EXECUTION

3.1 CONDUCTORS

- A. Pulling compounds may be used for pulling all power system conductors. Clean residue from the conductors and raceway entrances after the pull is made.
- B. Pulleys or blocks shall be used for alignment of the conductors when pulling. Pulling shall be in accordance with manufacturer's specifications regarding pulling tensions, bending radii of the cable, and compounds. A dynamometer shall be utilized on all high voltage cable pulls to ensure that the maximum allowed cable tension is not exceeded. The Architect and Engineer shall be notified prior to all cable pulls. Record the maximum strain of each pull.
- C. Conductors entering terminal or junction boxes mounted on hermetically sealed refrigeration compressor motors shall be copper.

- D. Make up and insulate wiring promptly after installation of conductors. Wire shall not be pulled in until all bushings are installed and raceways terminations are completed. Wire shall not be pulled into conduit embedded in concrete until after the concrete is poured and forms are stripped.
- E. Wire devices external to isolating panels with copper stranded conductors having a cross-linked polyethylene insulation or equivalent with a dielectric constant of 3.5 or less.
- F. Minimum insulation wall thickness shall be 1/32" for #10 and #12 AWG and 5/64" for #8 AWG and larger conductors. Wiring shall be color coded in accordance with NEC and appropriate NFPA standards.

3.2 CONNECTORS

- A. Control and special systems wires shall be terminated with a tool applied spade flared lug when terminating at a screw connection.
- B. All tool applied compression connectors shall be applied per manufacturer's recommendations and physically checked for tightness.

3.3 COLOR CODING

- A. Secondary service, feeders, and branch circuit conductors shall be color coded. Phase color code to be consistent at all feeder terminations, A-B-C left-to-right, A-B-C top-to-bottom, or A-B-C front-to-back.
- B. Use solid color compound or solid color coating for No. 12 and No. 10 branch circuit conductors and neutral sizes.
- C. Phase conductors No. 8 and larger color code using one of the following:
 - 1. Solid color compound or solid color coating.
 - 2. Stripes, bands, or hash marks of color specified above.
 - 3. Colored as specified using 3/4-inch wide tape. Apply tape in half overlapping turns for a minimum of three inches for terminal points and in junction boxes, pull boxes, troughs, manholes, and handholes. Apply the last two laps of tape with no tension to prevent possible unwinding. Where cable markings are covered by tape, apply tags to cable stating size and insulation type.
- D. Switch legs, travelers, etc., to be consistent with the phases to which connected or a color distinctive from that listed.
- E. Color coding of the flexible wiring system conductors and connectors shall be the manufacturer's standard.
- F. For modifications and additions to existing wiring systems, color coding shall conform to the existing wiring system.

3.4 TESTS:

- A. Perform insulation resistance tests on all new phase and neutral conductors of feeders and circuits over 100 Amperes ampacity, 480 Volt and below, with a 1000 Volt, direct

current, megohmmeter. The written test report listing the results of the test to be submitted to Architect. Equipment which may be damaged by this test shall be disconnected prior to the test.

- B. Scheduling of electrical testing must be coordinated with Owner well in advance, especially if the impact of the required testing is expected to affect employees and clients of Owner's facilities and services.
- C. There is a low probability that the fiber optic cables that enter Owner as the digital communications backbone may be routed through fiber optic aggregate switches that provide a data path to the building. The loss of power during power insulation resistance testing will shut down the aggregate switches. There is a low probability that the shutdown of a critical aggregate switch may result in the loss of data pathway.
- D. The existing low voltage power feeder conductor testing will be performed on the existing feeders as listed in Appendix "A" to this section. NETA test procedures and recommendations are to be employed. Megohmmeter feeder insulation testing is limited to direct current potentials of less than 200 Volts. The limiting voltage is the panel branch circuit breaker contact clearing voltage rating of 150 Volts RMS. Testing by a NETA certified Technician is required, utilizing test equipment with valid metrology certification and calibration tracking. To assure safe and accurate testing, the following procedure is intended to be employed.
 - 1. The testing will be performed with the building fully de-energized. This will effectively minimize in-building circulating currents within the building. Only ground circulating currents from the campus and metropolitan power system are expected to be present. These are expected to be confined to the building mechanical piping systems.
 - 2. To safely isolate the existing Owner's electrical service, 208 Volt power energizing the existing equipment will be de-energized by coordination with the electrical utility.
 - 3. The opening of the switches implies interrupting the energy flow on the three-phase primary circuit. Proper safety precautions, arc flash protection, personnel burn protection measures, dielectric isolation and powering down the unit substation, secondary load need to be exercised prior to opening the metal enclosed switch.
 - 4. The existing feeder conductor testing within the building is expected to be occurring without the benefit of the operation of the building lighting system. Temporary, self-powered, portable lighting is expected to be required.
 - 5. Testing of an individual feeder requires visual confirmation of the integrity of the insulation and minimal conductor corrosion at both ends of the feeder termination.
 - 6. The energizing feeder end enclosure and the panel feeder end enclosure must be opened and visually reviewed.
 - 7. The feeder energizing circuit breaker will be opened.
 - 8. The panel branch circuit breakers will be opened. This should isolate the feeder conductors from the building electrical power system.
 - 9. The isolation of the feeder conductors will be confirmed with a low power, hand held Ohmmeter. This test is required to confirm the absence of any load (due to a malfunctioning circuit breaker being stuck in the "closed" position) on the feeder. This basically assures the feeder can be expected to safely be energized via the megohmmeter.

10. Testing of the feeder insulation can be performed from either the energizing feeder end or from the panel end at the Contractors discretion based on test energized conductor, inadvertent access, safety.
11. The resistance test between the feeder neutral conductor and the feeder conduit is intended to measure the continuity of the feeder conduit. This measurement must be taken from the panel interior. Measured resistance accuracy of +/- 0.1 ohm is accepted.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Expand the existing building reference ground electrode system.
- B. Expand the existing building reference ground access conductor system.
- C. Provide a complete ground system as specified herein and shown on the Drawings.
- D. Include bonding and connection of the reference ground electrode system to the domestic water, fire sprinkler water, chilled water and steam piping system.
- E. Include bonding and connection of the reference ground electrode system to the roof and penthouse mounted mechanical equipment.
- F. Include bonding of conduit systems.
- G. Include bonding and connection of the reference ground electrode system to the transformers.
- H. Include bonding and connection of the reference ground electrode system to the switchboard ground buses.
- I. Include bonding and connection of the reference ground electrode system to the communications MDF and IDF room reference ground buses.
- J. Include bonding and connection of the reference ground electrode system to the power distribution switchboard neutral bus, motors, and miscellaneous grounds required.
- K. Maintain electrical continuity of the existing ground array system as specified herein and shown on the Drawings. Included in this section are the minimum composition requirements and installation methods for the following:
 - 1. Busbars
 - 2. Bonding accessories

1.2 QUALITY ASSURANCE

- A. All cable and equipment shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the Owner or Owner Representative. Equipment and materials shall be of the quality and manufacture indicated. The equipment specified is based upon the acceptable manufactures listed. Where "approved equal" is stated, equipment shall be equivalent in every way to that of the equipment specified and subject to approval.

- B. Strictly adhere to all Building Industry Consulting Service International (BICSI), Electronic Industries Alliance (EIA) and Telecommunications Industry Association (TIA) recommended installation practices when installing communications/data cabling.
- C. Material and work specified herein shall comply with the applicable requirements of the following standards and the Authority Having Jurisdiction (AHJ).
 - 1. ANSI/TIA/EIA – 568 Commercial Building Telecommunications Cabling Standard
 - 2. TIA – 569 Commercial Building Standard for Telecommunications Pathways and Spaces
 - 3. ANSI/TIA/EIA – 606 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 - 4. ANSI-J-STD – 607 Joint Standard for Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications
 - 5. NFPA 70 – National Electric Code
 - 6. BICSI – Telecommunications Distribution Methods Manual, 11th Edition.

PART 2 - PRODUCTS

2.1 GROUNDING CONDUCTORS

- A. Green, 600 Volt, polyvinyl Chloride, THWN insulated copper for interior systems.
- B. Bare copper for underground or exterior systems.

2.2 CONNECTORS

- A. Cast, Compression, set screw or bolted type for building internal conductor termination.
- B. Form poured, exothermic welds (Cadweld) for use: exterior to the building, where exposed to the elements or below grade or underground and all ground electrode conductor connections.
- C. Grounding lugs where provided as standard manufacturer's items on equipment.

2.3 GROUND PADS

- A. Provide a ground pad at each location shown on the Drawings. The default Pad shall be 1000A rated copper bus nominally 1/4"x3"x12" long.
- B. Mount ground pads with stand-off devices to provide a minimum of 1-1/2 inches free space behind pad for access to lug nuts and washers.

2.4 GROUND RODS

- A. Copper clad steel, 5/8"x10'-0" long ground rods. Where ground wells are indicated, provide a 12-inch deep, 8-inch diameter precast concrete well with flush lid for accessibility and inspection of welded connections.
- B. Utilize RCP Vaults No. 12R12A with 12R12-t cover.

2.5 WALL-MOUNT BUSBARS

A. Telecommunications Main Grounding Busbar (TMGB)

1. Telecommunications Main Grounding Busbar (TMGB) shall be constructed of .25" (6.4 mm) thick solid copper bar.
2. The busbar shall be 4"H x 20"L (100 mm x 510 mm) and shall have 30 attachment points (two rows of 15 each) for two-hole grounding lugs.
3. The hole pattern for attaching grounding lugs shall meet the requirements of ANSI-J-STD – 607-A and shall accept 27 lugs with 5/8" (15.8 mm) hole centers and 3 lugs with 1" (25.4 mm) hole centers.
4. The busbar shall include wall-mount stand-off brackets, assembly screws and insulators creating a 2.5" (63.5 mm) standoff from the wall.
5. The busbar shall be UL Listed as grounding and bonding equipment.
6. The wall-mounted TMGB busbars are bonded to the building reference ground electrode system. The connection to the building reference ground electrode system is part of the overall Telecommunications Bonding and Grounding System.

B. Telecommunications Grounding Busbar (TGB)

1. Telecommunications Grounding Busbar (TGB) shall be constructed of .25" (6.4 mm) thick solid copper bar.
2. The busbar shall be 2"H x 12"L (50 mm x 300 mm) and shall have 9 attachment points (one row) for two-hole grounding lugs.
3. The hole pattern for attaching grounding lugs shall meet the requirements of ANSI-J-STD – 607 and shall accept 6 lugs with 5/8" (15.8 mm) hole centers and 3 lugs with 1" (25.4 mm) hole centers.
4. The busbar shall include wall-mount stand-off brackets, assembly screws and insulators creating a 2.5" (63.5 mm) standoff from the wall.
5. The busbar shall be UL Listed as grounding and bonding equipment.
6. The wall-mounted TGB busbars are bonded to the building reference ground electrode system. The connection to the building reference ground electrode system is part of the overall Telecommunications Bonding and Grounding System.

C. Two Mounting Hole Ground Terminal Block

1. Ground terminal block shall be made of electroplated tin aluminum extrusion.
2. Ground terminal block shall accept conductors ranging from #14 AWG through 2/0.
3. The conductors shall be held in place by two stainless steel set screws.
4. Ground terminal block shall have two 1/4" (6.4 mm) holes spaced on 5/8" (15.8 mm) centers to allow secure two-bolt attachment to the rack or cabinet.
5. Ground terminal block shall be UL Listed as a wire connector.

D. Compression Lugs

1. Compression lugs shall be manufactured from electroplated tinned copper.
2. Compression lugs shall have two holes spaced on 5/8" (15.8 mm) or 1" (25.4 mm) centers, as stated below, to allow secure two bolt connections to busbars.
3. Compression lugs shall be sized to fit a specific size conductor, sizes #6 to 4/0, as stated below.
4. Compression lugs shall be UL Listed as wire connectors.

PART 3 - EXECUTION

3.1 INSTALLATION

- E. Grounding Conductors: Default sized in accord with Article 250, 250.102(C)(1), Tables 250-122 and 250-66 of the National Electrical Code. Where larger size conductors are indicated on the drawings, utilize the size indicated on the drawings.
- F. Grounding Conductor Connectors: Made up tight and located for future servicing and to insure low impedance.
- G. Ground the electrical system, the cold-water service, structural steel, and transformers to the building ground grid.
- H. All Plug-in Receptacles: Bonded to the boxes, raceways, and grounding conductor.
- I. Provide equipment grounding conductor in all PVC conduit runs.
- J. Provide ground bonding to above ground portion of metal gas piping per NEC 250-104(b).
- K. All separately derived systems shall be solidly grounded to the reference ground electrode system via the building reference ground access conductor system. For separately derived system connections, such as the generator alternator WYE point to the ground electrode(s) must use exothermic or irreversible compression connectors.

3.2 EQUIPMENT

- L. Provide separate green insulated equipment ground conductor in all non-metallic and flexible electrical raceways. Effectively ground all luminaires, panels, controls, motors, disconnect switches, exterior lighting standards, and noncurrent carrying metallic enclosures. Use bonding jumpers, grounding bushings, lugs, buses, etc., for this purpose.
- M. Provide grounding bushings on all feeder conduit entrances to panels and equipment enclosures and bond bushings to enclosures with minimum No. 10 AWG conductor. Connect the equipment ground to the building system ground. Use the same size equipment ground conductors as phase conductors, up through No. 10 AWG.

3.3 GROUND PADS

- N. Drill ground pads as necessary for attachment of all grounding conductors as required.
- O. Utilize 2-hole lugs for terminating No. 4/0 AWG and larger ground conductors.
- P. Bond ground pads to adjacent existing accessible structural steel with #4/0 bare copper cable, using form poured exothermic welds.

3.4 GROUND RESISTANCE TEST

- Q. Ground electrode resistance test shall be accomplished with a ground resistance direct-reading single test meter utilizing the Fall-of-Potential method and two reference electrodes. Perform test prior to interconnection to other grounding systems. Orient the

concrete-encased ground electrode to be tested and the two reference electrodes in a straight line spaced fifty (50) feet apart. Drive the two reference electrodes five (5) feet deep.

- R. Test results shall be in writing and shall show temperature, humidity and condition of the soil at the time of the tests in the case where the ground resistance exceeds 5 ohms. The Engineer will issue additional instructions.

3.5 WALL-MOUNT BUSBARS

- S. Attach busbars to the wall with appropriate hardware according to the manufacturer's installation instructions.
- T. Conductor connections to the power, TMGB or TGB shall be made with two-hole bolt-on compression lugs sized to fit the busbar and the conductors.
- U. Each lug shall be attached with stainless steel hardware after preparing the bond according to manufacturer recommendations and treating the bonding surface on the busbar with antioxidant to help prevent corrosion at the bond.
- V. The wall-mounted busbars are bonded to the building reference ground electrode system. The connection to the building reference ground electrode system is part of the overall Telecommunications Bonding and Grounding System.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Support and attachment components for equipment, conduit, cable, boxes, and other electrical work.

1.2 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2013.
- D. MFMA-4 - Metal Framing Standards Publication; Metal Framing Manufacturers Association; 2004.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.
- F. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
 - 2. Coordinate the work with other trades to provide additional framing and materials required for installation.
 - 3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
 - 4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
 - 5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
- B. Sequencing:
 - 1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 30 00, Cast-in-Place Concrete.

1.4 SUBMITTALS

- A. See Division 01 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for metal channel (strut) framing systems, non-penetrating rooftop supports, and post-installed concrete and masonry anchors.

1.5 QUALITY ASSURANCE

- A. Comply with NFPA 70.
- B. Comply with applicable building code.

PART 2 - PRODUCTS

2.1 SUPPORT AND ATTACHMENT COMPONENTS

- A. General Requirements:
 - 1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
 - 2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
 - 3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported with a minimum safety factor of 150% Include consideration for vibration, equipment operation, and shock loads where applicable.
 - 4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
 - 5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
 - a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
 - b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Materials for Metal Fabricated Supports: Comply with Section 05 50 00, Metal Fabrications.
- C. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
 - 1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
 - 2. Conduit Clamps: Bolted type unless otherwise indicated.
 - 3. Manufacturers:
 - a. Cooper Crouse-Hinds, a division of Eaton Corporation: www.cooperindustries.com.
 - b. Erico International Corporation: www.erico.com.
 - c. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
 - d. Thomas & Betts Corporation: www.tnb.com.
 - e. Substitutions: See Section 01 60 00, Product Requirements.

- D. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.
1. Manufacturers:
 - a. Cooper Crouse-Hinds, a division of Eaton Corporation: www.cooperindustries.com.
 - b. Erico International Corporation: www.erico.com.
 - c. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
 - d. Thomas & Betts Corporation: www.tnb.com.
 - e. Substitutions: See Section 01 60 00, Product Requirements.
- E. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
1. Comply with MFMA-4.
 2. Channel Material:
 - a. Indoor Dry Locations: Use painted steel, zinc-plated steel, or galvanized steel.
 - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
 3. Manufacturers:
 - a. Cooper B-Line, a division of Eaton Corporation: www.cooperindustries.com.
 - b. Thomas & Betts Corporation: www.tnb.com.
 - c. Unistrut, a brand of Atkore International Inc: www.unistrut.com.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
 - e. Source Limitations: Furnish channels (struts) and associated fittings, accessories, and hardware produced by a single manufacturer.
- F. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
1. Minimum Size, Unless Otherwise Indicated or Required:
 - a. Equipment Supports: 1/2 inch diameter.
 - b. Busway Supports: 1/2 inch diameter.
 - c. Single Conduit up to 1 inch (27mm) trade size: 1/4 inch diameter.
 - d. Single Conduit larger than 1 inch (27mm) trade size: 3/8 inch diameter.
 - e. Trapeze Support for Multiple Conduits: 3/8 inch diameter.
 - f. Outlet Boxes: 1/4 inch diameter.
 - g. Luminaires: 1/4 inch diameter.
- G. Non-Penetrating Rooftop Supports for Low-Slope Roofs: Steel pedestals with thermoplastic or rubber bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with support fixtures as specified.
1. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.

2. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports.
3. Mounting Height: Provide minimum clearance of 6 inches under supported component to top of roofing.
4. Manufacturers:
 - a. Cooper B-Line, a division of Eaton Corporation: www.cooperindustries.com.
 - b. Erico International Corporation: www.erico.com.
 - c. Unistrut, a brand of Atkore International Inc: www.unistrut.com.
 - d. Substitutions: See Section 01 60 00, Product Requirements.

H. Anchors and Fasteners:

1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
2. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
3. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
4. Hollow Masonry: Use toggle bolts.
5. Hollow Stud Walls: Use toggle bolts.
6. Steel: Use beam clamps, machine bolts, or welded threaded studs.
7. Sheet Metal: Use sheet metal screws.
8. Wood: Use wood screws.
9. Plastic and lead anchors are not permitted.
10. Powder-actuated fasteners are not permitted.
11. Hammer-driven anchors and fasteners are not permitted.
12. Preset Concrete Inserts: Continuous metal channel (strut) and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
 - a. Comply with MFMA-4.
 - b. Channel Material: Use galvanized steel.
 - c. Minimum Channel Thickness: Steel sheet, 12 gage, 0.1046 inch minimum base metal thickness.
 - d. Manufacturer: Same as manufacturer of metal channel (strut) framing system.
13. Post-Installed Concrete and Masonry Anchors: Evaluated and recognized by ICC Evaluation Service, LLC (ICC-ES) for compliance with applicable building code.
14. Manufacturers - Mechanical Anchors:
 - a. Hilti, Inc: www.us.hilti.com.
 - b. ITW Red Head, a division of Illinois Tool Works, Inc: www.itwredhead.com.
 - c. Powers Fasteners, Inc: www.powers.com.
 - d. Substitutions: See Section 01 60 00, Product Requirements

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as shown on the drawings.

- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install support and attachment components in a neat and workmanlike manner in accordance with NECA 1.
- C. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.
- D. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- E. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
- F. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
- G. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- H. Equipment Support and Attachment:
 - 1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
 - 2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 - 3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 - 4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- I. Conduit Support and Attachment: Also comply with Section 26 05 33, Raceway and Boxes for Electrical Systems.
- J. Box Support and Attachment: Also comply with Section 26 05 33, Raceway and Boxes for Electrical Systems.
- K. Interior Luminaire Support and Attachment: Also comply with Section 26 51 00, Interior Lighting.
- L. Exterior Luminaire Support and Attachment: Also comply with Section 26 56 00, Exterior Lighting.
- M. Preset Concrete Inserts: Use manufacturer provided closure strips to inhibit concrete seepage during concrete pour.

- N. Secure fasteners according to manufacturer's recommended torque settings.
- O. Remove temporary supports.
- P. Identify independent electrical component support wires above accessible ceilings (only where specifically indicated or permitted) with color distinguishable from ceiling support wires in accordance with NFPA 70.

3.3 FIELD QUALITY CONTROL

- A. See Section 01 40 00, Quality Requirements, for additional requirements.
- B. Inspect support and attachment components for damage and defects.
- C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide raceways and conduits of specified types for all electrical systems wiring, except where clearly shown or specified otherwise. All fittings, boxes, hangers and appurtenances shall be included.
- B. Size raceways and conduits as specified. Where no size is indicated, conduit may be the minimum code permitted size for the quantity of conductors installed, based upon NEC tables for conductors with type THW/TW insulation.

PART 2 - PRODUCTS

2.1 METALLIC CONDUITS

- A. Galvanized Rigid Conduit (GRC): Smooth surfaced heavy wall mild steel tube of uniform thickness and temper, reamed and threaded at each end and protected inside and out with galvanizing, sherardizing, or equivalent process. GRC shall comply with NEC Article 344.
- B. Intermediate Metallic Conduit (IMC): Smooth surface, intermediate wall mild steel tube of uniform thickness and temper, reamed and threaded at each end, and protected inside and out with galvanizing, sherardizing, or equivalent process. IMC shall comply with NEC Article 342.
- C. Electrical Metallic Tubing (EMT): Smooth surface, thin wall mild steel tube of uniform thickness and temper, galvanized or sherardized on the outside, and enameled on the interior. EMT shall comply with NEC Article 358.
- D. Flexible Conduits (Flex):
 - 1. Flexible Metallic Conduit: Interlocking single strip steel construction, galvanized inside and out after fabrication. Flex shall comply with NEC Article 350.
 - 2. Liquid Tight: Similar to flexible metallic conduit, except encased in a liquid tight polyvinylchloride or equivalent outer jacket over the flexible steel core, and shall comply with NEC Article 350.

2.2 PRECAST CONCRETE MANHOLES AND HANDHOLES

- A. Manholes and handholes shall be precast with 28 day, 4,500 psi or greater compressive strength concrete and designed for AASHTO HL-93 loading.
 - 1. Minimum dimensions for manholes and handholes are shown on the Contract Drawings.
 - 2. Extension sections shall be used to increase vertical dimensions to those shown on the Contract Drawings.

- B. Slope floors toward drain points leaving no pockets or other non-draining areas. Provide a drainage outlet at the low point of the floor constructed with a heavy, cast iron, slotted or perforated cover grate.
- C. Provide raceway entrances on all four sides.
 - 1. Knockout panels or precast individual raceway openings may be used.
 - 2. On sides where no raceways are installed under this Contract, provide knockout panels for future raceway installation.
 - 3. Provide knockout(s) for ground rods.
- D. Manholes shall utilize heavy-duty type frames and covers made of cast iron, suitable for HL-93 street loading, except where otherwise shown on the Contract Drawings.
 - 1. The covers shall weigh at least 500 pounds and have machined bearing surfaces.
 - 2. Provide indented type covers, solid top design, with 2 drop handles each.
- E. Handholes shall utilize heavy-duty type frames and covers suitable for HL-93 street loading, unless otherwise shown on the Contract Drawings. Provide diamond plate covers, solid top design, with 2 handles for removal, unless otherwise shown on the Contract Drawings.
- F. Covers shall be identified by inscription according to the Contract Drawings.
 - 1. The inscription for circular cast covers shall be located on the upper side of each cover, and feature integral cast-in letters not less than 2 inches high.
 - 2. Where galvanized steel diamond plate covers are furnished, identification shall be by welding the lettering to each cover prior to galvanizing.
- G. In manholes, provide 11 gauge galvanized steel cable racks with adjustable arms and approved insulators in each manhole.
 - 1. Set inserts in the concrete walls for the attachment of racks. Do not use bolts or studs embedded in concrete for attaching racks.
 - 2. Unless otherwise indicated, set racks and inserts on not greater than 3 foot centers around the entire inside perimeter of the manhole, arranged so that all raceway ends are clear for future cable installation.
 - 3. Provide racks with 11 gauge galvanized steel arms 12 to 18 inches long and two insulators per arm as shown on the Contract Drawings. Non-metallic, heavy cable racks are acceptable, if rated at 350 pounds for 14 inch arms and 250 pounds for 20 inch arms.
- H. For each manhole and handhole provide one pulling iron embedded in the concrete wall near the floor in each corner (4 total) unless otherwise indicated. Utilize 3/4 inch round stock securely fastened to the overall steel reinforcement before concrete is poured.
- I. Utilize manhole and handhole hardware of steel, hot-dip galvanized after fabrication.
- J. Damp-proofing compound shall be factory applied, one coat, on all outside surfaces. Damp-proofing shall be coal-tar bitumastic.

- K. Approved Manufacturer: Oldcastle Quazite (concrete polymer) or approved equal.

2.3 NON-METALLIC CONDUITS

A. Underground Ducts:

1. PVC, Encased Burial: Type EB for concrete encasement, shall meet or exceed the current requirements of EB-20/ASTM F512, NEMA TC-6 and U.L. 651. Rate for use with 90°C wire.
2. PVC, Direct Burial: Type DB suitable for direct burial, shall meet or exceed the current requirements of DB-20/ASTM F512 and NEMA TC-6. Rate for use with 90°C wire.

- B. Rigid Non-Metallic Conduit: Type II PVC Schedule 40, suitable for use with 90°C rated wire. Conduit shall conform to UL Standard 651 and carry appropriate UL listing for above and below ground use.

2.4 WIREWAYS

- A. Troughs: Steel, painted, square in cross section, preformed knock-outs on standard spacing, screw cover.
- B. Fittings: Tees, elbows, couplings as required for configuration shown on the Drawings.

2.5 FITTINGS

A. GRC and IMC:

1. Threaded Locknuts: Sealing type where used with NEMA 2, 3, 3R, 4 and 12 enclosures.
2. Threaded Bushings: 1 1/4 inch and larger, insulated, grounding type as required under Section 26 05 26, Grounding and Bonding for Electrical Systems.
3. Threaded Couplings: Standard threaded of the same material and as furnished with conduit supplied. Erickson type couplings may be used where required to complete conduit runs larger than 1 inch.

B. EMT:

1. Connectors: Steel compression ring or steel set screw type for conduit termination, with insulated throat, suitable for conditions used.
2. Steel EMT fittings are required to have at least 5% recycled steel content.
3. Use lay-in grounding type bushings where terminating grounding conductors.
4. Couplings: Steel compression ring or steel set screw type, concrete tight.

- C. Threadless: GRC and IMC couplings and box connectors may be steel threadless, compression ring or set screw type for use with conduits 1 inch and smaller where installed in poured concrete locations or where limited working space makes threaded fittings impractical.

- D. Weatherproof Connectors: Threaded.

- E. Expansion Couplings: Equal to O.Z. type EX with jumper.
- F. Seal-Offs: With filler fiber, compound, removable cover.

2.6 METALLIC BOXES

- A. Flush and Concealed Outlet Boxes: For interior installation, provide:
 - 1. Electroplate Zinc galvanized stamped steel.
 - 2. All interior installation backboxes are 4-inch square minimum, with 1-1/2-inch minimum depth
 - 3. Depth of backbox is required to be adjusted as required to meet current National Electrical code fill requirements.
 - 4. Provide backboxes with screw ears for device ring mounting, knock-out plugs, mounting holes, and fixture studs if required
 - 5. Provide backboxes with green bolt, threaded ground conductor termination capability
 - 6. Terminate copper raceway bonding conductor at backbox threaded ground termination via green threaded bolt
 - 7. Terminate copper raceway bonding conductor on circuit ground conductor via conductor splice
 - 8. Isolated circuit ground conductors are not bonded to the backbox threaded ground termination
 - 9. RACO or equal
- B. Surface Outlet Boxes: Galvanized stamped steel same as above for use on ceilings; cast steel or aluminum with threaded hubs or bosses for use on walls.
- C. Large Boxes: Boxes exceeding 4-11/16 inches square when required shall be welded steel construction with screw cover and painted, steel gauge as required by physical size, Hoffman, Circle AW or equal.
- D. Systems: Boxes for systems devices shall be as recommended by the systems manufacturer, suitable for the equipment installed. Equip with grounding lugs, brackets, device rings, etc., as required.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mount backboxes staggered in wall framing spaces to reduce acoustic coupling from one space to another. Back to back backbox installation is not allowed.
- B. Conceal all conduits in finished spaces. Concealed conduits shall run in a direct line with long sweep bends and offsets. GRC and IMC embedded in concrete below grade or in damp locations shall be made watertight by painting the entire male thread with Rustoleum metal primer or equal before assembly.
- C. Route exposed conduit parallel or at right angles to structural building lines and neatly offset into boxes. Conduits attached directly to building surfaces shall closely follow the surfaces. Conduit fittings shall be used to "saddle" under beams. Drilling or notching of

existing beams, trusses on structural members shall be coordinated with Architect prior to commencing.

- D. GRC and IMC terminations at boxes, cabinets, and general wiring enclosures shall be rigidly secured with double locknuts and bushings or approved fittings. Conduit shall be screwed in and shall engage at least five threads in hub where conduit boxes with threaded hubs or bosses are used. Insulating bushings shall be used for conduits 1-1/4 inches or larger.
- E. Keep conduit and raceways closed with suitable plugs or caps during construction to prevent entrance of dirt, moisture, concrete, or foreign objects. Raceways shall be clean and dry before installation of wire and at the time of acceptance.
- F. Pack spaces around conduits with polyethylene backing rods and seal with polyurethane caulking to prevent entrance of moisture where conduits are installed in sleeves or block-outs penetrating moisture barriers.

3.2 INSTALLATION OF PRECAST CONCRETE MANHOLES AND HANDHOLES

A. Excavation and Bedding

- 1. The excavation shall be made to a depth to allow for the overall assembled height and bedding of manhole or handhole as shown on the Contract Drawings. Provide and install risers as shown to bring the manhole or handhole to the required finish grade.
- 2. Over excavate at least 12 inches around the sidewalls of the manholes and handholes for ease of installation and to prevent sluffage.
- 3. Provide a minimum of 10 cubic feet of clean, round drain rock for drainage, as shown on the Contract Drawings.
- 4. Install bedding, which shall consist of 1 foot minimum of 3/4 inch minus crushed rock, graded level, and compacted.

B. Inspection and Setting

- 1. Excavation must be completely dewatered before setting manholes or handholes.
- 2. Notify the Construction Manager 7 days in advance of the installation of each manhole or handhole. Obtain approval of excavation and bedding before installing manhole or handhole.
- 3. Assemble by lowering each section into the excavation.
- 4. Lower the base section first, set level and firmly position before placing intermediate and top sections.
- 5. Ensure that the seal surfaces between sections are clean and that the gaskets are in place.
- 6. Completed manhole shall be inspected by the Construction Manager before backfilling.

C. Backfilling

- 1. Backfill around all manholes and handholes shall consist of good compact-able material such as 3/4 inch minus crushed rock, sand or clean earth fill containing

- no rocks larger than 3/4 inch. No voids shall remain between the manhole or handhole walls and native soil excavation.
2. Backfilling shall not be done until manhole or handhole is completely assembled, making certain to compact the backfill progressively from the bottom to the top surface.

D. Grouting

1. Grout risers, covers, and raceway entering manholes and handholes with non-shrink cement grout as specified in Section 03 30 00.
2. Apply grout in a manner to ensure filling of all voids in the joint being sealed.

E. Grounding - manholes and handholes shall be grounded as shown on the Contract Drawings.

F. In each manhole and handhole, except for covers and cover mounting frames, all metallic components, including entering metallic raceway grounding bushings, cable racks, and inserts shall be grounded to the ground rod in the manhole or handhole.

1. Provide a minimum of 1 driven ground rod sized and located as shown on the Contract Drawings.
2. Connect the rod to all metallic parts using a copper bond conductor.
3. Grounding conductor shall be exothermically welded to the ground rod.
4. Connection to other metallic parts may be by exothermic welding, or bolting using stainless steel hardware.

G. Identification

1. Identify each manhole and handhole with the numbers shown on the Contract Drawings and as required by Paragraph 2.01 F of the Specification.
2. In addition, identify each manhole and handhole with 3 inch high letters stenciled with black paint on white paint background just below the cover on the inside wall and on the bottom of the cover. Paint shall be exterior latex masonry type.
3. Identify each duct entering the manhole and handhole. Numbers shall be 2 inches high stenciled with black paint on white paint background, located as shown on the Contract Drawings. Paint shall be exterior latex masonry type.

H. Utility Manholes and Handholes

1. All manholes and handholes installed for other utilities shall meet that utility's standards and requirements and shall be installed according to their specifications and as indicated on the Contract Drawings. The contractor shall notify the Construction Manager 7 days in advance of installing utility manholes and handholes. Each utility may provide an on-site inspector during construction of their facilities and the installation is subject to the utility's approval.
2. Utilities involved with this Project include, but not limited to, Pacific Power (PPL). Other third party utilities may be involved in some portions of the project.

3.3 CONDUIT

- A. Minimum raceway size for power circuits is 3/4 inch, industry standard measure.

- B. Minimum raceway size for low energy control circuits is 1/2 inch, industry standard measure.
- C. Control circuits are to be routed via dedicated raceways, separate from power conductors. Control circuits with the same disconnecting means as the power circuit, and NEC compliant insulation matching the power circuit insulation rating may be routed in a common raceway with the power conductors.
- D. Raceways crossing structure expansion joints or structure seismic joints shall have adequate range (axial as well as transverse) of intrinsic motion compensation to meet the structure design motion limits.
- E. Provide NEC sized, bonded internal grounding continuity conductors within raceways crossing structure expansion joints or structure seismic joints as required to assure raceway ground continuity during and after the structure design motion limits.
- F. Structure design motion limits include shortening as well as lengthening of the instantaneous raceway length as compared to the circuit length. Conductors or cables installed in raceways crossing structure expansion joints or structure seismic joints shall have adequate coiled circuit length and coil storage space to meet the structure design motion limits. The conductors are expected to slide within the raceway system as required to maintain circuit continuity and insulation integrity during the structure design motion limits.
- G. Conduits for branch circuit use are required to have not more than 40% fill at the completion of the project.
- H. GRC may be used in all areas for wiring systems. GRC shall be installed for wiring underground in cast concrete construction, in damp locations, and in hazardous areas for serving fire pump controllers and where subject to mechanical injury with threaded fittings made up tight. IMC may be used in locations not in contact with earth or fill.
- I. EMT may be used in all other dry protected locations. Provide green equipment bonding conductor where used for power circuit feeders 2-inch and larger. EMT, whether exposed or concealed, shall be securely supported and fastened at intervals of nominally every 8 feet and within 24 inches of each outlet, ell, fitting, panel, etc.
- J. Flex shall be used for connections to vibration producing equipment and where installation flexibility is required with a minimum 12 inches slack connection. Limit flex length to 36 inches for exposed equipment connections and 72 inches in concealed ceiling and wall cavities. PVC jacketed flex shall be used in wet locations, areas subject to wash-down, and exterior locations.
- K. PVC Type II Schedule 40 may be used underground and in and under interior slabs, poured concrete walls, and where scheduled or noted on the Drawings. Make connections with waterproof solvent cement. Provide GRC at 60 degree and larger bends and where penetrating slabs.
- L. MC Cable may be used as permitted per NEC, state and local codes. MC Cable not permitted for feeders, service entrance feeders and homeruns.

3.4 RACEWAYS

- A. Surface metal wireways may be installed at locations to serve motor starters or other control devices where required by a multitude of wiring interconnections or physical layout.

3.5 FITTINGS

- A. Metallic raceways and conduits shall be assembled continuous and secured to boxes, panels, etc., with appropriate fittings to maintain electrical continuity. All conduit joints shall be cut square and reamed smooth with all fittings drawn up tight.
- B. Crimp-on, tap-on, indenter type, malleable iron or cast set screw fittings shall not be used.

3.6 BOXES

- A. Boxes and outlets shall be mounted at nominal center line heights shown on the drawings. Adjust heights in concrete masonry unit (CMU) walls to prevent devices or finish plates from spanning masonry joints.
- B. Boxes are to be located and accessible for service, inspection or circuiting adjustment at the time of final project completion. Access clearance is required to meet current NEC, NESC, OHSA and NFPA 70E requirements.
- C. Permanently label all boxes per specification requirements. At a minimum, the panel of energization and circuit breaker number shall be visible.
- D. Circuiting exiting panel or switchboard enclosures shall have metal conduit protection.
- E. Outlet boxes shall be of code required size to accommodate all wires, fittings, and devices. Provide multi-gang boxes as required to accept devices installed with no more than one device per gang. Equip all metallic boxes with grounding provisions.
- F. Flush wall switch and receptacle outlets used with conduit systems shall be 4 inches square, 1-1/2 inches or deeper, with one or two-gang plaster ring mounted vertically. Where three or more devices are at one location, use one-piece multiple gang tile box or gang box with suitable device ring.
- G. Wall bracket and ceiling surface mounted luminaire outlets shall be 4-inch octagon 1-1/2 inches deep with 3/8-inch fixture stud where required. Wall bracket outlets to have single gang opening where required to accommodate fixture canopy. Provide larger boxes or extension rings where quantity of wires installed requires more cubic capacity.
- H. Junction boxes installed in accessible ceiling or wall cavities or exposed in utility areas shall be a minimum of 4 inches square, 1-1/2 inches deep with appropriately marked blank cover.
- I. Boxes for the special systems shall be suitable for the equipment installed. Coordinate size and type with the system supplier.
- J. Provide pull boxes where shown for installation of cable supports or where required to limit the number of bends in any conduit to not more than three 90-degree bends. Use

galvanized boxes of code required size with removable covers installed so that covers will be accessible after work is completed.

- K. Recessed boxes shall be flush with finished surfaces or not more than 1/8-inch back. Set boxes level and plumb. Long screws with spacers or shims for mounting devices will not be acceptable. No combustible material shall be exposed to wiring at outlets.
- L. Covers for flush mounted boxes in finished spaces shall extend a minimum of 1/4-inch beyond the box edge to provide a finished appearance. Finish edge of cover to match cover face.
- M. Boxes installed attached to a stud in sheet rock walls shall be equipped with opposite side box supports equal to Caddy #760. Install drywall screw prior to finish taping. Methods used to attach boxes to studs shall not cause projections on the face of the stud to prevent full length contact of sheet rock to the stud face.

3.7 PULL WIRES

- A. Install nylon pull lines in all empty conduits larger than 1 inch where routing includes 25 feet or more in length or includes 180 degrees or more in bends.
- B. Where conduits requiring pull lines are stubbed out and capped, coil a minimum of 36 inches of pull line and tape at termination of conduit for easy future access. Label pull lines as to conduit starting or terminations point and intended future use.

3.8 UNDERGROUND CONDUITS AND CONCRETE ENCASEMENT

- A. Underground Ducts for Electric Service: Refer to and meet the requirements of the latest Pacific Power (PPL) Electric Service Requirements (ESR).
- B. GRS conduit shall be used for ells in PVC conduit runs. Minimum permissible bend radius is 36 inches.
- C. Use conduit plugs during bending for conduit 2 inches and larger. Remove plugs only after conduit has cooled. Field bends with radius greater than 100 feet may be formed cold. When placing cold bends, maintain adequate spacing from the inside of the bend to excavation walls for the required 3 inches of concrete.
- D. Underground conduits shall be arranged as shown on the Contract Drawings.
- E. Slope all underground conduits for drainage to manholes or handholes and away from buildings. Minimum slope is 3 inches per 100 feet.
- F. Conduit spacers shall be placed at a maximum of 5 foot intervals. NOTE: For PPL Service conduits, conduits must have spacers and the conduits must be installed with 3" from outside to outside of conduit. Refer to PPL ESR.
- G. Secure underground raceways to prevent displacement during concrete encasement or earth backfilling. Make minor changes in location or cross-section as necessary to avoid obstructions or conflicts. Where raceway runs cannot be installed as shown because of conditions not discoverable prior to trenching, refer the condition to the Engineer of Record and PPL Engineer for direction before further work is done.

- H. When placing concrete around the underground raceways, adjust the delivery chute so the fall distance of the concrete into the trench is minimal.
- I. Concrete direct fall distance shall be 2 feet or less.
- J. Use a splash board to divert the flow of concrete away from the trench sides and avoid dislodging soil and stones.
- K. All plastic underground raceways may expand or contract as concrete is placed and cured. Therefore, when placing concrete encasement, always encase from one end of the duct section toward the other end to allow the free end to move. Never encase from each end of the section toward the center.
- L. Place concrete continuously between manholes, handholes and pullboxes. If the placement stops for more than 2 hours, 8 foot lengths of No. 4 reinforcement steel shall be placed longitudinally around the perimeter of the concrete envelope on 12 inch centers and with 2 inches minimum cover. Half of each 8 foot length shall be in each pour.
- M. Mandrel underground raceways and provide seals.
- N. Underground conduits shall be inspected and approved by the PPL Engineer and Engineer of Record before placing concrete encasement. Notify the PPL Resident Engineer and Engineer of Record seven (7) days before placing concrete. Clean trenches, dewater, and adjust clearances as directed to obtain the minimum concrete dimensions shown on the Contract Drawings. If conduits are for PPL electric service, contact PPL Engineer as well as Engineer of Record.
- O. Concrete encasement and steel reinforcement shall be as indicated in the project drawings.
- P. Concrete shall have a 3,000 psi minimum, twenty-eight (28) day strength with red dye. Slump shall be 7 inch with a 1 inch tolerance.
- Q. Install reinforcing steel for concrete encased ductbank only where shown on the Contract Drawings.
- R. Concrete shall be placed 5 days working days after PPL Engineer's and Engineer of Record's approval.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Clearly and properly identify the complete electrical system to indicate the loads served or the function of each item of equipment connected under this work.

PART 2 - PRODUCTS

2.1 LABELS

- A. Pre-printed: Permanent material pre-printed with black on white, with adhesive backing, Brady, 3M or equal
- B. Laminated Plastic: 3-ply laminated plastic, black with white letters, for 208/120V equipment. Lamicoid or equal
- C. Clear Plastic Tape: Black 12-point Helvetica medium characters machine imprinted on clear tape, Merlin, Kroy or equal
- D. Plastic Tape: Black or red with white letters, adhesive backing, field printed with proper tool, Dymo-tape or equal
- E. Wire Markers: White with black numbers, adhesive backed tape on dispenser roll, Brady, 3M or equal

PART 3 - EXECUTION

3.1 POWER DISTRIBUTION AND SERVICE SWITCHBOARDS

- A. Label the main and feeder protective devices in all distribution panels and motor control centers with laminated plastic labels indicating the function or the load (panelboard) served.
- B. Provide laminated plastic labels for all bussed sections.
- C. Provide laminated plastic labels for all power distribution or feeder circuit breakers.
 - 1. Indicate the full designations of panelboards, distribution switchboards and equipment energized by the circuit breaker.
 - 2. Spaces are required to be identified via laminated plastic labels indicating the maximum ampere rating or size of future breaker, switch or starter that may be installed in the space reserved.
- D. Utilize the full designations of panelboards, distribution switchboards and equipment (mechanical as well as Owners) as found on the originating drawings and specifications.
- E. Provide type written schedules along with laminated plastic labels for all power distribution and service switchboards. The typewritten schedules will be mounted in a holder adjacent to the switchboard.

3.2 BRANCH CIRCUIT PANELBOARDS

- A. Indicate panel name with laminated plastic labels.
- B. Indicate voltage phase and feeder source, feeder wire size, and feeder breaker or fuse size with plastic tape labels on the inside of the panel door.
- C. Provide typewritten panel directories, with protective, clear transparent covers, accurately accounting for every breaker installed including spares. Schedules shall use the actual room designations assigned by name or number near completion of the work and not the space designation on the Construction Drawings.

3.3 EQUIPMENT

- A. Label all disconnect switches, motor starters, relays, contactors, and time switches indicating equipment served with plastic tape labels.
- B. Where the controlling device is remote mounted from the serving panel, include the serving panel designation and circuit number with additional plastic tape labels.

3.4 DEVICES

- A. Label each receptacle plate with preprinted clear plastic press on labels with 3/16" minimum black letters indicating serving panel and circuit number. Clean all oils, dirt and any foreign materials from plate prior to label application.
- B. Receptacles connected to a GFCI protected circuit downstream from the protecting device shall be so labeled.

3.5 RACEWAYS AND BOXES

- A. Label all pull boxes and junction boxes for systems with paint or marker pen on box cover identifying system. Where box covers are exposed in finished areas, label inside of cover. Covers shall be color labeled as follows: 208Y/120V wiring - black; fire alarm - red; communications - green; security - blue.
- B. Label each end of pull wires left in empty conduits with tags or tape indicating location of other end of wire.

3.6 SYSTEMS

- A. Complex control circuits may utilize any combination of colors with each conductor identified throughout, using wraparound numbers or letters. Use the number or letters shown where the Drawings or operation and maintenance data indicate wiring identification.
- B. Label the fire alarm and communication equipment zones, controls, indicators, etc., with machine printed labels or indicators appropriate for the equipment installed as supplied or recommended by the equipment manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install the materials for the complete secondary service and distribution system as specified herein and shown on the Drawings. Secondary distribution system shall be fully rated. Series rating shall not be acceptable.
- B. Provide EUSERC CT/Terminal Enclosure, meter socket, reinforced concrete pads and ground grid for use by the serving utility and per Pacific Power Standards (2022 PPL ESR). Coordinate pad size, openings, type of construction, conduit arrangement and grounding requirements with the utility prior to construction.

1.2 UTILITY METERING

- A. Provide utility metering facilities where indicated on the Drawings, complying with the established serving utility requirements. Provide quantity and style of meter sockets and accessories required by the utility.
- B. Include all metering charges or connection costs charged by the serving utility in the original proposal. Refer to Coordination of Work section of these Specifications.

1.3 SUBMITTALS

- A. Shop drawings.
- B. Product data.
- C. Ground Fault Protection System Test Report.
- D. Coordination study.
- E. Operation and maintenance data.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Square D, Siemens

2.2 MAIN DISTRIBUTION PANEL

- A. Panel: Sectionalized, floor standing, metal enclosed units containing molded or insulated case circuit breakers. Panel shall be listed by Underwriters' Laboratories and shall bear a UL label as suitable for use as service equipment; NEMA 3R Enclosure.
- B. Circuit Breakers: Main breakers and sub distribution feeder breakers shall be AC power type, dead front, with solid state trip devices. Interrupting rating shall be a minimum of 65,000 rms symmetrical amperes. Breakers shall be rated for standard continuous duty. Field adjustable trip functions shall consist of:

1. Long time ampere rating.
 2. Long time delay.
 3. Instantaneous pickup.
 4. Short time pickup.
 5. Short time delay.
 6. Ground fault pickup.
 7. Ground fault delay.
- C. Equip breakers with the following additional auxiliary devices:
1. Shunt trip.
 2. Undervoltage trip.
 3. Normally (open) (closed) alarm switch.
 4. Electric operator.
 5. Ground fault test button.
 6. Ground fault trip indicator.
 7. Trip indication with auxiliary contacts.
 8. Overcurrent indication with auxiliary contacts.
- D. Equip breakers with zone selective interlocking on the (short time)(ground fault)(short time and ground fault) trip for maximum coordination.
- E. Bus work: Copper, sized as shown on the Drawings, 100% neutral with a maximum hot-spot temperature rise of 65 degrees C. above an ambient of 40 degrees C. under continuous full load current and rated to withstand (42,000 A) (65,000 A) (100,000 A) fault current. Include bussing provisions for future devices in all spaces called for. Provide a copper ground bus in bottom of enclosure, full length of assembly.
- F. Digital Metering: Provide ION Metering per UO Campus Metering Standards, potential and current transformers, ammeter, voltmeter, power factor meter, required selector switches and associated accessories for monitoring the properties of the incoming secondary power as provided by the utility. Ammeter and voltmeter selector switches shall have provisions for reading individual phase amperes, individual phase to neutral volts, phase to phase volts and include a meter "off" position. Metering equipment shall be switchboard grade with nominal 2% accuracy.
- G. Finish: Primed and finished with not less than two coats of light gray enamel.

2.3 BRANCH PANELBOARDS

- A. Branch Circuit Panels: Bolt-in circuit breaker type with copper bussing. Panels shall be fitted with flush lift latches and locks keyed alike, same as existing. Deliver all panel keys to the Owner at completion of the project.
- B. Main Circuit Breakers: Equip panels indicated with main circuit breakers sized as scheduled and mounted behind door at top of panel. Back feeding of branch circuit breakers is not acceptable.

- C. Branch Circuit Breakers: Molded case, thermal magnetic type. Breakers shall have short circuit capacity rating to withstand the maximum short circuit duty which can be expected at the breaker location in the electrical system. Breakers mounted in branch panelboards shall be of the bolt-in type. Circuit breakers used for switching duty shall be UL listed for that purpose and marked "SWD". Minimum short circuit rating for any circuit breaker: 10,000 A.I.C. for 120V and 208V breakers, 14,000 A.I.C. for 277V and 480V breakers.
- D. Wiring Gutters: A minimum of 4 inches wide except where feeder conductors enter where a minimum of 6 inches clear shall be provided. Feeder conductors to enter directly in line with lug terminals wherever practicable. Provide separate feeder studs for each feeder conductor compression lug.
- E. Cabinets: Flush doors with concealed hinges and mounting clamps equal to Square D Mono Flat, or ITE Decor trim. Surface panels shall have metal face trims with no sharp edges or corners. Finish surface panel tubs to match face trim. Equip with a sheet metal skirt to floor, finished to match panel to prevent dirt accumulation where conduits penetrate floor. Access panel on skirt may be screw type for access to interior.
- F. Ground Bus: Provide a grounding bus with termination capacity for the grounding conductor sized for the branch circuit equipment grounding conductors in isolated ground 208Y/120V panels identified by suffix IG. Grounding bus shall be bonded to the panel cabinet.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install the secondary distribution system assemblies and equipment as shown on the Drawings, parallel and square with the building lines.
- B. Neatly lace and secure the conductors of the feeder circuits individually at maximum 2 foot intervals. The cable lugs shall not support the weight of the cables.
- C. Mount a spare fuse cabinet adjacent to each fusible distribution panel. Equip cabinet with one complete set of spare fuses of each size and type installed in the panel with appropriate fuse pullers.

3.2 BRANCH PANELBOARDS

- A. Install panelboards plumb and level, located as shown on the Drawings up 6'-0" to top unless noted otherwise.
- B. Equip selected breakers with mechanical locking devices such that they may be locked in the "on" position. Selected breakers shall include those serving alarm systems, fire suppression systems, communications systems and other critical loads directed.
- C. Install a spare 3/4-inch conduit from flush panels for each three single pole breakers or spaces provided. Terminate conduits above accessible ceiling or as directed.
- D. Utilize circuit breakers in existing panels which are to remain. Where faulty or inadequate breakers are found in these panels, replace with suitable breakers from panels removed during demolition.

- E. Equip all circuit breakers associated with multi-wire branch circuit breakers with handle ties per NEC 210-4. Provide grouping of multi-wire branch circuits per NEC 210-4(D).

3.3 CONCRETE PADS

- A. Provide nominally 6-inch deep concrete housekeeping pads under all free-standing pieces of switchgear and floor mounted transformers. Unless otherwise noted on the drawings, pads shall extend nominally 6 inches beyond the edges of the equipment.

3.4 COORDINATION AND ARC FLASH STUDY

- A. Provide arc flash study per NEC, IEEE 1584, and NFPA 70E.
- B. Coordination study shall be prepared for the electrical overcurrent devices to assure proper equipment and personnel protection.
- C. The study shall present an organized time-current analysis of each protective device in series from the individual device back to the source. The study shall reflect the operation of each device during normal and abnormal current conditions.
- D. The coordination study shall be prepared by qualified engineers of the switchgear manufacturer, Electro-Test, Electrical Systems Analysis, Inc. or approved. The contractor is responsible for providing all pertinent information required by the preparers to complete the study.
- E. The complete study shall include a system one-line diagram and protective coordination curves.
- F. Coordination curves shall be prepared to determine the required settings of protective devices to assure selective coordination. The curves shall graphically illustrate on log-log paper that adequate time separation exists between each protection device shall be plotted in such a manner that all upstream devices will be clearly depicted on one sheet. The following specified information shall also be shown on the coordination curves:
 - 1. Device identification.
 - 2. Voltage and current ratio for curves.
 - 3. 3-phase and 1-phase ANSI damage points for each transformer.
 - 4. No-damage, melting, and clearing curves for fuses.
 - 5. Cable damage curve.
 - 6. Transformer inrush points.
 - 7. Maximum short circuit cut-off point.
- G. A table shall be developed to summarize the settings selected for the protective devices. Included in the table shall be the following:
 - 1. Device identification.
 - 2. Circuit breaker sensor rating, long-time, short-time, and instantaneous settings, and time bands.
 - 3. Fuse rating and type.
 - 4. Ground fault pickup and time delay.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide switches of proper characteristics as disconnecting means.

1.2 SUBMITTALS

- A. Shop Drawings: Indicate field dimensions, description of materials and finishes, component connections, anchorage methods, hardware, and installation procedures.
- B. Product Data.
- C. Operating and Maintenance Data.

1.3 WORK IN RELATED SECTIONS

- A. Section 26 05 53, Identification for Electrical Systems

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Square D

2.2 DISCONNECTS

- A. Safety and disconnect switches shall be NEMA type HD (heavy duty), quick-make, quick-break, dual rated with electrical characteristics as required by the system voltage and the load served. Switches shall be equipped with a defeatable cover interlock and indicating handle that will accept a minimum of three padlocks.
- B. Enclosures shall be NEMA I for indoor use, unless specifically noted otherwise and NEMA 3R where installed exposed to the weather or designated by the subscript "WP".
- C. Disconnects shall be fusible or non-fusible as designated on Drawings.
- D. Rejection Fuse Clips: Provide for fusible switches (30 to 600A) to prevent the installation of Class H and Class K non-current-limiting fuses.

PART 3 - EXECUTION

3.1 DISCONNECT SWITCHES

- A. Provide all code required disconnect switches under this work, whether specifically shown or not.
- B. Provide one manufacturer for all disconnect switches on the project.

- C. Disconnect switches shall be installed as recommended by the manufacturer and shall be square with the building structural lines.
- D. Install fuses in all fused switches.
- E. Provide identification as specified in Section 26 05 53, Identification for Electrical Systems.

END OF SECTION

DIVISION 27
COMMUNICATIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Telecommunications system to include the following systems:
 - 1. Structured Cabling System for Communications Systems
 - 2. Pathways for Communications Systems
 - 3. Grounding and Bonding System for Communications Systems
 - 4. Firestopping for Communications Systems

1.2 ADDITIONAL REQUIREMENTS

- A. Coordination of Work: Coordinate Work among project Specification divisions and contractor/subcontractors involved in this project. Coordination of Work Includes following instructions provided the Construction Manager or General Contractor.
- B. General Compliance Requirements:
 - 1. Provide a complete and operable system in compliance with project drawings, Specifications, referenced standards, applicable building codes, and Authority Having Jurisdiction (AHJ) requirements. Scope of this contract includes planning, design, materials, equipment, labor, configuration, programming, testing, startup and commissioning services, and documentation costs for complete and operable system that meets all requirements indicated on drawings or contained in Specifications.
 - 2. Comply with all contract documents, Specifications, drawings, manufacturer's instructions, and Owner and AHJ requirements. In case of conflict among applicable documents or standards, notify Architect of apparent conflict and comply with most stringent requirements unless otherwise directed.
 - 3. Work includes all items required for complete system whether identified in Specification or drawings or not.
- C. Information about general construction and architectural features and finishes to be derived from structural and architectural drawings and Specifications only.
- D. Items referred to in singular number in Contract Documents to be provided in quantities necessary to complete Work.
- E. Work related to telecommunications system to be installed by a manufacturer's authorized or certified trained installer and supervised manufacturer's authorized or certified Engineer. Owner reserves the right to review and approves any personnel assigned to this project in a supervisory or managerial role.

- F. Contractor Qualifications: At least 10 years of comparable experience with communications projects. As part of the proposal, Contractor to submit at least three comparable Project reference descriptions with reference contacts. Comparable projects to be equal to or exceed size and complexity of work on drawings.

1.3 CODES AND STANDARDS

A. General:

- 1. All work, including but not limited to cabling, pathways, support structures, wiring, equipment, installation and workmanship to comply with the latest editions of the requirements of the AHJ, National Electrical Code, National Electrical Safety Code, all applicable local rules and regulations, equipment manufacturer's instructions, and the National Electrical Contractors Association (NECA) Standard of Installation. In case of discrepancy or disagreement between the documents noted above, satisfy the most stringent requirements.
- 2. Other Sections of this document contain References to Codes and Standards that are applicable to the Section.

B. Codes:

- 1. National Fire Protection Association (NFPA):
 - a. NFPA 70, National Electrical Code (NEC), 2008.
 - b. NFPA 72, National Fire Alarm Code, 2007.
 - c. NFPA 780, Standard for the Installation of Lightning Protection Systems, 2004.

C. Reference Standards:

- 1. Telecommunications Industry Association (TIA)
 - a. TIA-568-C.0, Generic Telecommunications Cabling for Customer Premises.
 - b. TIA-568-C.1, Commercial Building Telecommunications Cabling Standard Part 1: General Requirements.
 - c. TIA-568-C.2 , Commercial Building Telecommunications Cabling Standard—Part 2: Balanced Twisted Pair Cabling Components.
 - d. TIA-568-C..3, Optical Fiber Cabling Components Standard.
 - e. TIA-569-B, Commercial Building Standards for Telecommunications Pathways and Spaces.
 - f. TIA-569-B-1, Commercial Building Standard for Telecommunications Pathways and Space.
 - g. TIA-606, Administration Standard for Commercial Telecommunications Infrastructures.

- h. ANSI J-STD-607-A, Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.
 - i. TIA-942, Telecommunications Infrastructure Standard for Data Centers.
 - j. ANSI/NECA/BICSI 568 Standard for Installing Telecommunications Systems.
 - k. Category TSB-155, Guidelines for the Assessment and Mitigation of Installed 6 Cabling to Support 10GBASE-T.
2. Other Reference Materials:
- a. ANSI/NECA/GICSI-568 Standard, Installing Commercial Building Telecommunications Cabling.
 - b. BICSI Telecommunications Distribution Methods Manual (TDMM), current edition.
 - c. Institute of Electrical and Electronic Engineers (IEEE).
 - d. National Electrical Manufacturers Association (NEMA).
 - e. Underwriters Laboratories (UL) Cable Certification and Follow Up Program.

1.4 ABBREVIATIONS, ACRONYMS AND DEFINITIONS

- A. AFF: Above Finished Floor.
- B. AHJ: Authority Having Jurisdiction.
- C. AWG: American Wire Gauge.
- D. BICSI: Building Industry Consulting Services International.
- E. CAT6: Category 6 Copper Cable.
- F. CAT6A: Category 6A Copper Cable.
- G. EIA: Electronic Industries Association.
- H. HVAC: Heating, Ventilation, and Air Conditioning.
- I. IDF: Intermediate Distribution Frame.
- J. IEEE: The Institute of Electrical and Electronics Engineers.
- K. MDF: Main Distribution Frame.
- L. PoE: Power over Ethernet (IEEE 802.3af).
- M. SCS: Structured Cabling System.
- N. TIA: Telecommunications Industry Association.

- O. TR: Telecommunications Room.
- P. TO: Telecommunications Outlet.
- Q. UPS: Uninterruptible Power Supply.
- R. VOIP: Voice over Internet Protocol.
- S. WAO: Work Area Outlet.

1.05 SUBSTITUTIONS

A. Substitution Requests:

1. Substitution requests will be considered only if submitted to the Architect not less than ten working days prior to project bid date. Acceptance or rejection of proposed substitution is at Owner's Representative's sole discretion. No exceptions.
2. Requests for substitutions to be considered not approved unless approval is issued in writing by Owner's Representative.

B. Rejection:

1. For equipment, cabling, wiring, materials, and all other products indicated or specified as no substitutions or no alternates, Owner does not expect nor desire requests for substitutions and alternate products other than those specified.
2. Owner reserves right for Owner's Representative to reject proposed substitution requests and submissions of alternates without review or justification.

1.6 WARRANTY

A. General Requirements: Comply with additional requirements in contract general requirements and extended warranties required in other Specification Sections. Refer to all Division 27, Communications Sections for specific additional warranty requirements that exceed or are in addition to those of this Section.

B. Contractor Warranty:

1. Provide all services, materials and equipment necessary for successful operation of the entire communications systems for a period of one year after system acceptance. Scope of warranty includes all equipment, devices, wiring, accessories, software, hardware, installation, programming, and configuration required to maintain a complete and operable system. Provide manufacturer's published recommended preventative maintenance procedures during warranty period. This applies to all items except those specifically excluded, or items where a longer period of service and warranty is specified or indicated.

2. All warranties to be effective for one year, minimum, from date Certificate of Final Acceptance is issued. Warranty to cover repair or replacement of defective materials, equipment, workmanship, and installation that may be incurred during this period. Warranty Work is to be done promptly and to Owner's satisfaction. In addition, warranty to cover correction of damage caused in making necessary repairs and replacements under warranty.
3. Additional Warranty Responsibilities:
 - a. Obtain written equipment and material warranties offered in manufacturer's published data without exclusion or limitation, in Owner's designated name. Replace material and equipment that require excessive service during guarantee period as determined by Owner.
 - b. Provide two business day service beginning on date of Substantial Completion and lasting until termination of warranty period. Service to be at no cost to Owner. Service can be provided by installing contractor or by a separate service organization. Choice of service organization to be subject to Owner's approval. Submit name and a phone number that will be answered on a 24-hour basis each day of week, for duration of service.
 - c. Submit copies of equipment and material warranties to Owner before final acceptance.
 - d. If warranty work problems cannot be corrected immediately to Owner's satisfaction, advise Owner in writing, describing efforts to correct situation, and provide analysis of cause for problem. If necessary to resolve problem, provide at no cost services of manufacturer's engineering and technical staff at site in a timely manner to analyze warranty issues, and develop recommendations for correction, for review and approval by Owner.
- C. Owner's Rights: This Section is not to be interpreted to limit Owner's rights under applicable codes and under this Contract.
- D. Material and Installation Warranty: Provide all services, materials and equipment necessary to warrant the installation and performance of all pathway materials for a period of one year after beneficial use. Scope of warranty includes all equipment, devices, installation and other Work required to maintain a complete and operable system. Provide manufacturer's published recommended preventative maintenance procedures during warranty period.

1.7 MANUFACTURER'S EXTENDED WARRANTY

- A. Structured Cabling Systems to be covered by a two-part certification program provided by a single manufacturer and that manufacturer's certified vendor.
 1. The first part is an assurance program, which provides that the certified system will support the applications for which it is designed, during the 25 year warranty of the certified system.

2. The second portion of the certification is a 25 year warranty provided by the manufacturer and contractor on all products within the system (cords, telecommunications outlet/connectors, cables, cross-connects, patch panels, etc.).
- B. Provide documentation proving the cabling system's compliance to the End-to-End Link Performance recommendations, as listed in ANSITIA/EIA-568-B prior to the installation of the structured cabling system.
- C. Cabling system to conform to the current issue of industry standard ANSI/TIA/EIA-568. Adhere to all performance requirements of this document. Workmanship and installation methods used to be equal to or better than that found in the BICSI ITSIM and TDMM manuals.

1.8 COMPLETENESS OF WORK

- A. Provide complete and usable Work according to contract documents. All materials and equipment to be provided with all accessories and additional work required for field conditions, as well as additional work and accessories required for complete, usable, and fully functional construction and systems, even if not explicitly specified or indicated.
- B. Communications systems in this Contract to be provided as complete and operable systems in full compliance with requirements on drawings and Specification requirements. Drawings are diagrammatic and Specifications are performance based. Provide all work required to comply with drawings and Specifications, even if not explicitly indicated or specified.
- C. Coordinate installation of electrical systems with all field conditions and work of other trades. Minimum clearances and work required for compliance with NFPA 70, National Electrical Code (NEC), and manufacturer's instructions to be provided. Comply with additional requirements indicated for access and clearances. Verify all field conditions and dimensions that affect selection and provision of materials and equipment, and provide any disassembly, reassembly, relocation, demolition, cutting and patching required to provide work specified or indicated, including relocation and reinstallation of existing wiring and equipment.
- D. Protect from damage resulting from Contractor's operations existing facility, equipment, and wiring. Extra charges for completion and contract time extension will not be allowed because of field conditions or additional work required for complete and usable construction and systems. Comply with additional requirements indicated for access and clearances.
- E. Drawings and Specifications form complementary requirements. Provide work specified and not shown, and work shown and not specified as though explicitly required by both. Except where explicitly modified by a specific notation to contrary, it is to be understood that indication or description of any Item, in drawings or Specifications or both, carries with it instruction to furnish and install Item, provided complete.
- F. Terms: As used in these Specifications, "provide" means "furnish and install". "Furnish" means "to purchase and deliver to project site complete with every necessary appurtenance and support." "Install" means "to unload at delivery point at site and perform every operation necessary to establish secure mounting and correct operation at proper location in project."

- G. Authority Approvals: Give notices, file plans, obtain permits and licenses, pay fees, and obtain necessary approvals from authorities that have jurisdiction as required to perform work according to all legal requirements and with Specifications, Drawings, Addenda and Change Orders, all of which are part of Contract Documents.
- H. Supplementary Items:
 - 1. Provide supplementary or miscellaneous items, appurtenances, devices and materials necessary for a sound, secure and complete installation. Examine project drawings and other Sections of Specifications for requirements that affect work of this Section.
 - 2. Completely coordinate work of this Section with work of other Sections and provide a complete and fully functional installation. Refer to all other drawings and other Specifications Sections that indicate types of construction in which work to be installed and work of other Sections with which work of this Section must be coordinated.
- I. Quantities: Provide Items referred to in singular number in Contract Documents in quantities necessary to complete work.

1.9 PROJECT CONDITIONS

- A. Field Verification:
 - 1. Carefully verify location, use and status of all material, equipment, and utilities that are specified, indicated, or deemed necessary for removal. Verify all materials, equipment, and utilities to be removed are completely inactive and will not be required or in use after completion of project.
 - 2. Replace with equivalent any material, equipment and utilities that were removed by Contractor that are required to be left in place.
- B. Existing Utilities:
 - 1. As applicable, do not interrupt utilities serving facilities occupied by Owner or others unless permitted under following conditions and then only after arranging to provide temporary utility services according to requirements indicated.
 - 2. Notify Owner in writing at least 14 days in advance of proposed utility interruptions. Do not proceed with utility interruptions without Owner's written permission.
 - 3. Equipment installation:
 - a. Determine suitable path for moving unit substation into place; consider Project conditions.
 - b. Verify clearance requirements and locate equipment to meet installation tolerances.
 - c. Revise locations and elevations from those indicated to those required to suit Project.

1.10 DELIVERY STORAGE AND HANDLING

- A. Contractor is responsible for the deliveries, storing and handling of all materials relative to the communications systems, including materials supplied by others that are part of the installation contract. Material to be stored and protected according to manufacturer's instructions.
- B. Contractor is responsible for the security of all material during installation. For all material provided by contractor, or delivered to contractor on site, contractor assumes full responsibility and liability for any material shortages, damages, or loss due to storage and handling methods.

1.11 PERMITS AND INSPECTIONS

- A. All communications systems to meet or exceed the latest requirements of all national, state, county, municipal, and other authorities exercising jurisdiction over the telecommunications systems and the Project.
- B. Obtain and pay for all licenses, permits, and inspection fees required by local agencies and/or other agencies having jurisdiction.
- C. Furnish any additional labor or material required to comply with all local and other agencies having jurisdiction at no additional cost.
- D. Obtain certificates of inspection and approval from all authorities having jurisdiction, and forward copies of same to Owner's Representative prior to request for Project acceptance inspections, final completion inspections, substantial completion inspections, and acceptance testing/demonstrations.
- E. All required permits and inspection certificates to be made available at the completion of the telecommunications system installation and commissioning.
- F. Any portion of the communications work which is not subject to the requirements of an electric code published by a specific AHJ to be governed by the National Electrical Code and other applicable Sections of the National Fire Code, as published by the National Fire Protection Association (NFPA).
- G. Installation procedures, methods and conditions to comply with the latest requirements of the Federal Occupational Safety and Health Administration (OSHA).

1.12 EXAMINATION

- A. Prior to submitting a proposal, Contractor to examine site, review Project drawings and Specifications, and determine exact extent of work required. Include in proposals all materials, labor, and equipment required to complete required work indicated. Work that is necessary to obtain complete and usable Project as specified herein to be included in proposal, even if not indicated or specified.
- B. Bidders' Questions: Questions as to intent of drawings and Specifications, quality of materials to be used, and work to be performed, to be submitted in writing to the Architect. All answers and clarifications to drawings and Specifications will be issued in writing.

1.13 DIVISION OF WORK

- A. Contractor holding contract with Owner is responsible for coordinating work of all subcontractors to provide a complete and usable Project complying with contract provisions of Project documents.
- B. Failure to coordinate work by subcontractors and suppliers will not be considered justification for additional compensation or extension of schedule.

1.14 SPECIAL RESPONSIBILITIES AND INFORMATION

- A. Coordination of Information: Cooperate and coordinate with work of other Sections in executing work of this Section. Perform work so progress of entire project, including work of other Sections, will not be interfered with or delayed. Provide information as requested on items furnished under this Section, which are to be installed under other Sections. Obtain detailed installation information from manufacturers of equipment provided under this Section.
- B. Obtain final rough-in dimensions or other information as needed for complete installation of Items furnished under other Sections or by Owner. Keep fully informed as to shape, size and position of openings required for material or equipment to be provided under this and other Sections. Give full information so openings required by work of this Section may be coordinated with other Work and other openings and may be provided for in advance. In case of failure to provide sufficient information in proper time, provide cutting and patching or have same done, at no expense to Owner.
- C. Maintenance of Equipment and Systems: Maintain equipment and systems until Final Acceptance. Ensure adequate protection of equipment and material during delivery, storage, installation and shutdown and during delays pending final test of systems and equipment because of seasonal conditions.
- D. Use of premises to be restricted as directed by Owner's Representative and as required below:
 - 1. Remove and dispose of dirt and debris and keep premises clean. During progress of Work, remove equipment and unused material. Maintain building and premises in neat and clean condition; perform cleaning and washing as required to provide acceptable appearance and operation of equipment, to satisfaction of Owner's Representative.
 - 2. Garbage Removal: Provide for the removal from the site of all spoils, debris, boxes, packaging, crates, and trash generated from the Work.
 - 3. Storage: Store materials maintaining an orderly, clean appearance. If stored on site in open or unprotected areas, keep all equipment and material off ground by means of pallets or racks and covered with tarpaulins.
 - 4. Protection of Fireproofing:
 - a. Clips, hangers, clamps, supports and other attachments to surfaces to be fireproofed when possible, prior to start of spray fire proofing work.

- b. Install conduits and other items that would interfere with proper application of fireproofing after completion of spray fire proofing work.
 - c. Patching and repairing of fireproofing due to cutting or damage during course of work specified under this Section to be performed by installer of fireproofing and paid for by Section responsible for damage. This Work to be performed at no additional cost to Owner.
5. Movement of Materials: Unload materials and equipment delivered to site. Pay costs for rigging, hoisting, lowering and moving equipment on and around site, in building, or on roof.

PART 2 PRODUCTS

2.1 MATERIALS AND MANUFACTURERS

- A. Materials and equipment are to be new, UL listed, and be the most recent model.
- B. Structured cabling materials are to be from one manufacturer as specified.

PART 3 EXECUTION

3.1 EQUIPMENT INSTALLATION

- A. Install equipment according to manufacturer's written instructions. Install equipment level and plumb. Install wiring and cabling between equipment and all related devices.
- B. Cleaning: Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish. Clean devices internally using methods and materials as recommended by manufacturer.
- C. Connections: Tighten wiring connectors, terminals, bus joints, and mountings. This includes lugs, screws and bolts according to equipment manufacturer's published torque tightening values for equipment connectors. In absence of published connection or terminal torque values, comply with torque values specified in UL 486A and UL 486B.

3.2 CUTTING AND PATCHING

- A. Perform cutting and patching according to contract general requirements. In addition, following requirements apply:
 - 1. Perform cutting, fitting, and patching of electrical equipment and materials required to uncover existing infrastructure to provide access for correction of improperly installed existing or new Work.
 - 2. Remove and replace defective Work.
 - 3. Remove and replace Work not conforming to requirements of Contract Documents.
 - 4. Remove samples of installed Work as specified for testing.

5. Install equipment and materials in existing structures.
- B. Demolition and Removal:
1. Cut, remove, and legally dispose of selected equipment, components, and materials as indicated, including but not limited to removal of material, equipment, devices, and other items indicated to be removed and items made obsolete by new Work.
 2. Provide and maintain temporary partitions or dust barriers adequate to prevent spread of dust and dirt to adjacent areas.
- C. Protection of Work:
1. Protect structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed. During cutting and patching operations, protect adjacent installations.
 2. Patch finished surfaces and building components using new materials specified for original installation and experienced Installers.

3.3 PENETRATIONS AND SLEEVES

- A. Coordinate work with other Sections. Provide all necessary cabling sleeves and conduits.
- B. When required, set sleeves in forms before concrete is poured. Provide core drilling as necessary if walls are poured or otherwise constructed without sleeves and wall penetration is required. Do not penetrate structural members. Provide sleeves and packing materials at all penetrations of foundations, walls, slabs (except on-grade), partitions, and floors. Sleeves to meet requirements of pertinent Specifications. Lay out penetration and sleeve openings in advance, to permit provision in work. Set sleeves and conduit in forms before concrete is poured. Provide remedial work where sleeves and conduits are omitted or improperly placed.
- C. Sleeve Fill: Sleeves that penetrate outside walls, basement slabs, footings, and beams to be waterproof.
1. Fill slots, sleeves and other openings in floors or walls if not used.
 2. Fill spaces in openings after installation of conduit or cable.
 3. Fill for floor penetrations to prevent passage of water, smoke, fire, and fumes.
 4. Fill to be fire resistant in fire floors and walls, and to prevent passage of air, smoke and fumes.
 5. Sleeves through floors to be watertight and to extend 2-inches above floor surface.
 6. Where raceways passing through openings are exposed in finished rooms, finishes of filling materials to match and be flush with adjoining floor, ceiling, and wall finishes.
- D. Conduit Sleeves:
1. Annular space between conduit and sleeve to be at least 1/4-inch.

2. Sleeves to not be provided for slabs-on-grade unless specified or indicated otherwise.
 3. For sleeves through rated fire walls and smoke partitions, comply with requirements of Division 07, Thermal and Moisture Protection.
- E. Supports: Do not support piping risers or conduit on sleeves.
- F. Future Use: Identify unused sleeves and slots for future installation.

3.4 CORE DRILLING

- A. Avoid core drilling when possible. Where core drilling is unavoidable, locate all required openings prior to coring.
- B. Coordinate openings with other trades and utilities and prevent damage to structural reinforcement.
- C. Thoroughly investigate existing conditions in vicinity of required opening prior to coring.
- D. Set sleeves prior to installation of structure for passage of pipes, conduit, ducts, etc. Protect all areas from damage.

3.5 CLEANING

- A. Clean up debris daily. Cleanup costs are the responsibility of the Contractor.
- B. During progress of Work, remove equipment and unused material. Maintain building and premises in neat and clean condition. Perform cleaning and washing required to provide acceptable appearance and operation of equipment to satisfaction of Owner's Representative.
- C. After completion of Project, clean exterior surfaces of all equipment. Cleaning to include, but not be limited to, removal of concrete residue, dirt, and paint residue. Final cleaning to be performed prior to Project acceptance by Owner's Representative.

3.6 ACCESS AND ACCESS PANELS

- A. Provide access to materials and equipment that require inspection, replacement, repair or service. Provide access panels and/or doors as required to allow service of all equipment components. Provide access panels where items installed require access and are concealed in floor, wall, furred space or above ceiling. Ceilings consisting of lay-in or removable splined tiles do not require access panels. Locations of equipment requiring access to be noted on record drawings. Access panels to have same fire rating classification as surface penetrated.
- B. Coordination: Coordinate and prepare a location, size, and function schedule of access panels required to fully service equipment and deliver to Owner.
- C. Construction: Panels to be at least 12-inches by 12-inches. Locate access panels to provide optimum access to equipment for maintenance and servicing. Verify access panel locations and construction with Architect.

3.7 STARTUP AND OPERATIONAL TESTING

- A. Owner maintains right to have access to entire project site to prepare facility for occupancy and operation. Completion of startup and field testing to be accomplished as a prerequisite for substantial completion.
- B. Operate and maintain systems and equipment until final acceptance by Owner. All guarantees and warranties to not begin until final acceptance of systems and equipment by Owner. Acceptance requires, at a minimum, complete systems startup and testing.

END OF SECTION 270200

PART 1 GENERAL

1.1 SCOPE OF WORK

- A. Install empty raceway system, including underfloor and overhead distribution system, outlet boxes, floor boxes, pull boxes, cover plates, conduit, sleeves and caps, miscellaneous and positioning material to constitute complete system.
- B. Pathway Systems Include:
 - 1. Wall Boxes
 - 2. Raceway
 - 3. Conduit
 - 4. Conduit Bushings

1.2 RELATED SECTIONS

- A. Division 00, Procurement and Contracting Requirements
- B. Division 01, General Requirements
- C. Section 27 02 00, Communications General Requirements
- D. Section 27 15 00, Communications Horizontal Cabling
- E. Section 28 10 00, Access Control System

1.03 REFERENCES

- A. ASI/NFPA 70/250 - National Electric Code; Ground and Bonding.
- B. ASTM A123 - Specifications for Zinc (Hot Galvanized) Coatings on Iron and Steel.
- C. ANSI/TIA - 568-B Commercial Building Telecommunications Cabling Standard.
- D. ANSI/TIA - 569-A Commercial Building Standard for Telecommunications Pathways and Spaces.
- E. BICSI Telecommunications Distribution Methods Manual (TDMM), current edition.

1.04 QUALITY ASSURANCE

- A. All equipment to be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents to be subject to the control and approval of the Owner or Owner's Representative. Equipment and materials to be of the quality and manufacture indicated. Equipment specified is based upon the acceptable manufacturers listed. Where "approved equal" is stated, equipment to be equivalent in every way to that of the equipment specified and subject to approval.

- B. Strictly adhere to all Building Industry Consulting Service International (BICSI), Electronic Industries Alliance (EIA) and Telecommunications Industry Association (TIA) recommended installation practices.
- C. Ensure the "as installed" system is correctly and completely documented including engineering drawings, manuals, and operational procedures in such a manner as to support maintenance and future expansion of the system.
- D. Material and work specified to comply with the applicable requirements of the current revision of the following:
 - 1. ANSI/TIA – 568 Commercial Building Telecommunications Cabling Standard.
 - 2. TIA – 569 Commercial Building Standard for Telecommunications Pathways and Spaces.
 - 3. ANSI/TIA – 606 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.
 - 4. ANSI-J-STD – 607 Joint Standard for Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.
 - 5. NFPA 70 – National Electric Code.
 - 6. BICSI – Telecommunications Distribution Methods Manual
- E. Submittals:
 - 1. Product Data: For features, ratings, and performance of each component specified.
 - 2. Submit manufacturer's instructions for storage, handling, protection, examination, preparation, operation, and installation of products. Include application conditions or limitations of use stipulated by any product testing agency.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original unopened containers and packaging, with labels clearly indication manufacturer and material.
- B. Storage: Store materials in a dry area indoors, protected from damage, and in accordance with manufacturer's instructions.
- C. Handling: Protect materials and finishes during handling and installation to prevent damage.

PART 2 PRODUCTS

2.01 DEVICE OUTLETS

- A. Telecom: 4-11/16-inch square by 2-1/8-inch deep flush mounted box with single gang adapter plate with 1" conduit to nearest accessible ceiling space.

- B. Card Readers: Single gang box with 3/4" conduit to nearest accessible ceiling space.

2.02 STATION CONDUITS

- A. Station conduit is defined as conduit that originates at the device location and rises within the walls or is exposed from a raceway and extends up into the drop ceiling or over to the hallway distribution system.
- B. Provide station conduits from each device to above the drop ceiling or extend over to the hallway distribution systems consisting of size as shown on the Drawings.
- C. Provide an insulating press fit bushing on all conduits including interconnecting nipples and stub to distribution system. To prevent conflicts with other cables or conduits to cable tray, do not stub conduit less than 6-inches above or below conduit/cable tray center line. Where space permits, make every effort to bend station conduits down, so the flow of installed cables promotes the minimum length back to the Telecom Room and the least amount of bends in the cables. Bushings must be rated to be used in an environmental air handling space (Plenum).
- D. Provide measured pull line in 12-inch increments in each empty conduit.
- E. Indelibly mark station conduit at hallway distribution end with the room number that conduit serves.
- F. Do not use 90-degree electrical pulling elbows.
- G. Do not include more than two 90-degree bends between pulling points when installing station conduit runs. If the path of the station conduits requires more than 180 degrees of total bends, installation of an appropriately sized junction box is required.
- H. Place an appropriately sized junction box in each individual station conduit run that exceeds 100-feet in length.
- I. The use of a third bend in a conduit is only acceptable if:
 - 1. The total conduit run is reduced by 15%.
 - 2. The conduit size is increased to the next trade size.
 - 3. One of the bends is located within 12-inches of the cable feed end.

2.03 JUNCTION BOXES

- A. If the station conduit route exceeds the 180-degree of total bends limitation, an appropriately sized junction box is required within a straight section of the conduit run.
- B. Each station conduit run requires a separate junction box. The sharing of a junction box by multiple conduits is prohibited.

- C. Do not use a junction box in place of a bend. Install all junction boxes in station conduit paths within a straight section of the conduit run.

2.04 FIRESTOPPING

- A. Seal all buildings, floor/ceiling assemblies, stairs, and elevator penetrations with a 2-hour firestop assembly at a minimum, unless otherwise noted.
- B. Identify walls which are fire-rated construction. Seal walls with a minimum 2-hour firestop assembly.
- C. Communication pathways requiring firestopping to utilize removable/reusable firestopping

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Examine areas to receive cable management system. Notify Owner's Representative of conditions that would adversely affect the installation or subsequent utilization of the system.
- B. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. Install in accordance with recognized industry practices, to ensure equipment complies with requirements of the NEC, and applicable portions of NFPA 70B.
- B. Coordinate installation with other trades.
- C. Field verification is required before installation.
- D. Continuous conduit pathway is required in open to structure and hard lid areas.
- E. Exposed conduit is prohibited in front of house spaces. Exposed conduit in other areas to be approved by OCC prior to installation.

END OF SECTION 270528

PART 1 GENERAL

1.1 WORK INCLUDES

- A. Provide all labor, materials, and equipment for the complete installation of the Horizontal Cabling System.

1.2 SCOPE OF WORK

- A. Horizontal structured cabling system consists of 4-pair, Category 6 cabling, faceplates, jacks and patch panels. Provide a structured cabling system from each outlet location to the nearest Telecom Room.

1.3 RELATED SECTIONS

- A. Division 00, Procurement and Contracting Requirements
- B. Division 01, General Requirements
- C. Section 27 02 00, Communications General Requirements
- D. Section 27 05 28, Pathways for Communications Systems

1.4 QUALITY ASSURANCE

- A. Install all cable and equipment in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents to be subject to the control and approval of the Owner or Owner's Representative. Equipment and materials to be of the quality and manufacture indicated. Equipment specified is based upon the acceptable manufacturers listed. Where "approved equal" is stated, equipment to be equivalent in every way to that of the equipment specified and subject to approval.
- B. Strictly adhere to all Building Industry Consulting Service International (BICSI), Electronic Industries Alliance (EIA) and Telecommunications Industry Association (TIA) recommended installation practices when installing communications/data cabling.
- C. Material and work specified to comply with the applicable requirements of the current adopted revision of the following:
 - 1. ANSI/TIA – 568 Series Commercial Building Telecommunications Cabling Standard.
 - 2. TIA – 569 Commercial Building Standard for Telecommunications Pathways and Spaces.
 - 3. ANSI/TIA – 606 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.
 - 4. ANSI-J-STD – 607 Joint Standard for Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.
 - 5. BICSI – Telecommunications Distribution Methods Manual.

6. TIA/EIA-568-C.1 – Commercial Building Telecommunications Cabling Standard.
7. TIA/EIA-568-C.2 - Balanced Twisted-Pair Telecommunications Cabling and Components Standards.

1.5 WARRANTY

- A. Provide a minimum one-year warranty on installation.
- B. Provide the approved manufacturer's 25-year extended product and application assurance warranty.
- C. Warranty documentation is to be provided with the closeout documents.

1.6 SUBMITTALS

- A. Submit manufacturer's product data sheets, including part numbers, cut sheets and detailed descriptions for all proposed equipment included in project.

PART 2 PRODUCTS

2.1 COMMUNICATIONS HORIZONTAL CABLING

- A. Category 6 Unshielded Twisted-Pair (UTP) Cable:
 1. Category 6, 4-pair, 23 AWG cable, plenum rated, color blue.
- B. Manufacturers:
 1. Siemon, no substitutions.

2.2 CABLE TERMINATION HARDWARE

- A. Category 6 Patch Panel: Modular style, 48 port, rack mounted patch panel.
- B. Modular Jacks:
 1. Category 6, T568A/B wiring scheme, RJ45. Siemon Z6-06.
 2. Color: Outlet end to be blue, patch panel end to be black.
- C. Vertical, Flush Mount Faceplate:
 1. Stainless steel, 2-port with recessed label and label cover.
- E. Blank Insert: Single insert for empty faceplate ports, color to match faceplate.
- F. Category 6 Patch Cord:
 1. Category 6, stranded conductors, 8-position, 8-conductor, factory terminated.
 2. Provide (1) 2-foot and 7-foot cord for each termination.

G. Manufacturers:

1. Siemon, no substitutions.

PART3 EXECUTION

3.1 INSTALLATION

- A. Comply with all applicable codes, standards, and local codes and requirements. Identify and adhere to any unique codes or requirements governed by the region where the work is to be performed.
- B. Cable to be installed following industry standard practices.
- C. Horizontal cabling to be installed from the work area outlet location to the nearest Telecommunications Room. Horizontal cabling is not to exceed 300-feet.
- D. Do not exceed the maximum pulling tension or the minimum bending radius for twisted pair cables per manufacturer's specifications.
- E. Terminate Category 6 cabling on jacks and patch panels using the T568B wiring scheme.
- F. Cabling to be installed continuously from the jack to the patch panel. Splicing or coupling of Category cabling is prohibited.
- G. Provide proper separation distances between communications cabling and electrical wiring.
- H. Test all horizontal links per the ANSI/TIA-568-C Requirements. Perform testing with a Level IV tester. Testing to include:
 1. Wire map
 2. Length
 3. Attenuation
 4. NEXT
 5. Return loss
 6. ELFEXT loss
 7. Propagation delay
 8. Delay skew
 9. PSNEXT
 10. PSELFEXT
- I. Provide electronic and printed test results to the architect.

K. Labeling:

1. Label cabling with machine printed labels at each end, 6-inches from each termination.
2. Faceplate labels to be Telecom Room number, application (D for data), patch panel number and patch panel port number, using minimum 2 digits for each number. Examples for 2-port faceplate: C1.D,13.25-26, 01.D.04.11-12.
3. Label each patch panel sequentially in the Telecom Room.
4. Include outlet labeling at each location on the as-built drawings.

END OF SECTION 271500

DIVISION 28

ELECTRONIC SAFETY AND SECURITY

PART 1 GENERAL

1.1 SUMMARY

- A. The security system(s) will include an integrated access control system, Card readers and supporting infrastructure will be located where shown on the drawings.

1.2 RELATED SECTIONS

- A. Division 01, General Requirements
- B. Section 28 10 00, Access Control

1.3 GENERAL REQUIREMENTS

- A. General provisions of the Contract, including Contract Requirements and Division 01, General Requirements Specification Sections, apply to this Section.
- B. All drawings, conditions, Division 01, General Requirements Sections, and Instructions to Bidders apply to this specification section and related sections.
- C. The contractor is responsible for quantities and is urged to do a complete review for all counts.
- D. The contractor shall familiarize himself with the local conditions under which the work is to be performed, and its relationship to other trades, and any obstructions that may affect the proper execution and completion of the work. It is the contractor responsibility to ascertain any and all conditions, failure to understand or discover any condition that will result in a change order that increases the contract amount; that should have been discovered in the due diligence of reviewing the site and contract documents may result in denial of the change order.
- E. Any discrepancies found shall be submitted in writing prior to proceeding with the work.
- F. The Security Contractor shall furnish and install complete system components as described within these Drawings and Specifications to form a complete operating security system. This includes all necessary items and labor not specified but necessary for a complete and working system.
- G. Work shall be complete, certified, tested, and ready for operation.
- H. Contractor shall be responsible for repair of any base building structure or finishes that are damaged by the installation of any work specified in this section.
- I. No cutting or patching of existing work shall be permitted without prior written consent of the owner. Request for permission to do cutting, drilling, or chipping shall include explicit details and description of work, the proposed schedule, and shall not under any circumstances diminish the structural integrity, functional capabilities, or aesthetic appearance of the building components or systems.
- J. Except where the Architect, Engineer or manufacturer has specifically indicated dimensions, drawings are diagrammatic and shall not be scaled. Visit project site, survey existing conditions, and coordinate work to comply with documents.

- K. The Contractor shall coordinate with other trades to form a complete system. The Security Contractor is responsible for cabling, system components, devices, cores, miscellaneous conduits, sleeves, junction boxes, and all other peripherals not provided by others to form a complete security system.
- L. The Contractor shall strictly adhere to the latest version of all local, national, and international codes.
- M. The Contractor is responsible for providing all necessary permits and scheduling all necessary permits and inspections in a timely matter and as directed by the Owner's Project Manager (OPM).
- N. It is the Contractor's responsibility to protect and maintain all existing base building work and finishes that occur within the area of this scope.
- O. It is the Contractor's responsibility to protect building finishes that the Contractor may come in contact with that is not visibly confined to the work area.
- P. Any questions and/or concerns about the work to be performed shall be addressed prior to the start of that work. Otherwise, the Contractor shall be the responsible party once that work has started.
- Q. The Contractor shall include all necessary labor, tools, equipment, and ancillary materials required to furnish and install a complete and operational security system.
- R. The Contractor is to leave an area in the condition it was found in after completing their work. The Contractor shall patch, repaint, clean, adjust, reapply, or refurbish any existing area or surface that is affected as a result of the work

1.4 REFERENCE STANDARDS

- A. In addition to those referenced in Division 01, General Requirements, all work shall conform to the following standards and codes (most current edition, revisions, and addenda), where applicable. When a conflict occurs, follow the most stringent requirements:
 - 1. National Fire Protection Association:
 - a. NFPA 70, National Electrical Code
 - b. NFPA 72
 - c. NFPA 101
 - 2. Telecommunication Industry Association (TIA); Including, but not limited to:
 - a. TIA 568
 - b. TIA 569
 - c. TIA 598
 - d. TIA 606

- e. TIA 607
- f. TIA 758
- 3. American National Standard Institute (ANSI)
- 4. American Society for Testing and Materials (ASTM)
- 5. Underwriters Laboratories, Inc. (UL)
- 6. All local and state regulations
- 7. UL Listed to Standard 1409
- 8. CSA Certified to Standard C22.2 No. 1 M90.
- 9. FCC Rules Subpart J of Part 15 for a Class B computing device.

1.5 CONTRACTOR QUALIFICATIONS

- A. Must be factory/manufacturer certified in system being proposed. Provide written notification by manufacturer indicating contractor is certified.
- B. Must be properly licensed, including technicians for installing systems as outline in the specifications and drawings.
- C. Performed installation on same size and nature in scope of work. Provide three references of same size or larger in same scope of work.
- D. Provide project manager with experience in same size and nature of work. Submit resume of project manager.
- E. Have personnel trained in the installation and testing of systems. Submit qualifications of technicians, including any licenses, classes or prior work performed that qualifies them for this project.

1.6 SUBMITTALS

- A. General:
 - 1. Submit Shop Drawings, supplemental data, for all materials, equipment in all Sections of this Division as required by individual sections of this specification and in accordance with the requirements of Division 01, General Requirements.
 - 2. Support all submittals with descriptive materials, i.e., catalog sheets, product data sheets, diagrams, performance curves, and charts published by the manufacturer. These materials shall show conformance to specification and drawing requirements. Model view shall contain all information to indicate compliance with equipment specified.
 - 3. Where multiple products are listed on a single cut-sheet, circle or highlight the one being proposed.

4. No later than 30 days after award of the contract, the Contractor shall submit to the Architect for approval five copies of shop drawings in accordance with the plans and specifications. The drawings shall be in the form of blueline prints, drawn to scale, and shall be completely dimensioned and show front and rear elevations, together with such sections as required to show construction and all necessary wiring diagrams to show electrical and communications characteristics. Drawings shall be submitted in quintuple for review.
 5. All submittals shall be neatly bound in folders and have a summary sheet at the front of all equipment, complete with catalog numbers. Where equipment pertains to more than one building, submittals shall clearly indicate at which locations equipment is to be installed. Submittals may be submitted in electronic format using *.PDF files in which case a single copy is required for submittal.
 6. All shop drawings submitted for review shall be reviewed by the Contractor prior to submission and appropriately stamped for conformity to contract requirements. Failure of the Contractor to make this review and stamp the submittals will be considered by the Architect as being incomplete, will be returned without review and resubmittals will be required.
 7. In addition to those shop drawings requested, Contractor shall turn over to the Owner's representative on the job, three bound sets of complete approved shop drawings.
 8. The Architect shall review any submittal no more than two (2) times. Any subsequent reviews of materials shall be billed to the Contractor at the hourly rate of the reviewing personnel, at the Contractor's expense.
- B. Shop drawings submittal and review is to show compliance with the design intent. Specifically note any deviations from the Contract Documents and explain the reason and nature of the deviation. Such deviations will be reviewed or rejected on the submittal. Deviations not so identified and approved shall not relieve the Contractor from the requirements of the Contract Documents.
- C. Shop drawings shall contain job title and reference to the applicable drawing and/or specification number and OSHPD number.
- D. Submit details and calculations for support and anchors that are not specifically detailed on the drawings. Once these details and calculations have been reviewed by the Architect, submit them to OSHPD and obtain their approval.
1. Where pre-approved bracing will be employed:
 - a. System component brochure describing components used and detailed installation instructions.
 - b. Loads to be transmitted to the structure at anchor points
 2. Where anchorage, support and bracing are not detailed on the drawings and pre-approved systems are not used, submit details and calculations of proposed systems. Include:
 - a. Detailed drawings showing system to be installed, stamped by a Structural Engineer registered in the State of California.
 - b. Calculations, stamped by a Structural Engineer registered in the State of California.

3. Anchorage and Supports:

- a. Where equipment substitutions change the weight, size, configuration or other aspects of the systems and equipment that will affect the performance of anchorages and/or supports, submit calculations for proposed anchors and supports and install them as shown in these calculations. These calculations shall include the same certification and engineer's stamp as required above for seismic bracing. Obtain OSHPD approval for the proposed substitutions.
- b. Where substitutions will have no effect on anchors and supports detailed on Contract Documents, submit information on sizes, weights, center of gravity and other relevant information to demonstrate this fact.

- E. "As-builts": Upon completion of installation, the Contractor shall prepare "as-built" drawings of the system. These drawings shall show all device locations, details, wiring information, device and cable labeling information's and additional information deemed necessary for the proper documentation of the system. These "as-builts" shall include one set of drawings in AutoCAD of each floor plan indicating exact device locations, panel terminations, cable routes and wire numbers as tagged, and color coded on the cable tag.
1. Additionally, final point-to-point wiring diagrams of each type of device (on 30-inch x 42-inch format) shall be included in the "as-builts."
 2. "As-builts" shall be submitted to the OPM for approval prior to the final system acceptance walk-through.
 3. "As-built" drawings shall be generated using AutoCAD 2018 or higher. The AutoCAD drawing border and format must be approved by the Owner before submittal of any as-built documentation.
 4. Contractor shall provide four hard copies (bluelines/blacklines) and one soft copy (documents on diskette) of approved as-built documentation to OPM at least seven days before final Security System Installation Close-out.
 5. Operation and maintenance manuals: Two sets of operating manuals shall be provided explaining the operation and maintenance of the system.

1.7 SUBSTITUTION OF MATERIALS

- A. Submit base bid on equipment, products and materials as specified. Substitutions will not be considered.

1.8 CODES AND PERMITS

- A. Provide all necessary permits and schedule all inspections in a timely manner, so that the low-voltage cabling system is ready for operation on a date directed by the Owner.

1.9 WARRANTY

- A. Provide a one-year warranty on all parts, material, equipment, wiring and labor for the complete security system. The warranty period will start the day after Owner's final acceptance.
- B. System Service.

1. The Contractor shall provide emergency repair service for the system at no cost to the Owner, within 24 hours of a request for such service by the Owner during both the installation and warranty periods. This service shall be provided on a 24 hour per day, seven days per week basis.
 2. The Contractor shall provide normal service for the system at no cost to the Owner within one business day after receipt of the call.
- C. Maintain an on-site service log. Coordinate with Owner.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All material shall be new, and UL listed and free from damage or defects. The Contractor shall furnish all materials as required. The Contractor is responsible for furnishing any appropriate material needed for proper installation of the systems. Refer to the Drawings for further information and requirements.

PART 3 - EXECUTION

3.1 EXECUTION AND INSTALLATION

- A. The Contractor shall provide qualified and skilled workmanship throughout the scope of this project. All installation work shall be of the highest quality using proper installation methods and according to manufacturer's instructions and recommendations.
- B. The Contractor shall install a complete and functional security system as described with these Specifications and Drawings. The systems shall be installed utilizing good wiring and grounding practices according to local, national, and international codes and be acceptable to the Owner, Engineer and OPM. Life safety and fire codes shall be strictly followed where applicable.
- C. The Contractor shall provide on the job site, a factory trained supervisor to direct, assist and advise in the installation of all systems.
- D. The Contractor shall coordinate work and requirements with the OPM, General Contractor(s), Electrical Contractor(s), Low Voltage Contractor, and other applicable trades to ensure all coordination requirements are met.
- E. All cable is to be installed above the lay-in ceiling where possible. It is to be installed in conduit when routed in walls or above gypsum board or inaccessible ceilings. Cable shall be installed in conduit in exposed areas, such as the roof, stairwells, maintenance areas, parking garage, etc.
- F. Route all system cabling in conduit, Provide insulated bushings . Provide conduit where required due to building conditions, or inaccessible ceilings. Provide conduit sleeves around cables whenever they pass through a fire rated or full height partition. Provide UL rated fire systems at these points.
- G. The Contractor is responsible for providing all fire proofing material and conduit sleeves, unless otherwise indicated. The Contractor shall seal around all conduit and wiring whenever it passes through a floor or through fire rated partitions. All fireproofing systems shall be UL rated for the application.

- H. Rated cable shall be furnished and installed in all spaces. All cable installed in underground conduits must be rated for direct burial use. Cable shall meet equipment manufacturer recommendations for type, size, and usage.
- I. All cabling unless otherwise noted is to be concealed above lay-in ceilings in finished areas and in conduit, or wire ways. The Contractor shall provide "J-hooks" to properly support the cable. Individual cables above the ceiling space shall be independently supported using hangers or J-hooks secured to the building structure. All cable is to maintain a minimum of 12" from the other building equipment or appurtenances.
- J. Do not damage the outside jacket of any cable. Cables shall not be spliced.
- K. The Contractor shall support all cable throughout the system. Cables shall be routed in groups of similar types. All cables being pulled shall not exceed the manufacturers recommended pulling tensions or bending radii. Cables shall be supported horizontally above lay-in ceiling on J-hooks. J-hooks shall be installed at 5'-0" intervals. J-hook rows shall be installed in straight rows above corridors and hallways. Support cable routed vertically (where conduit is not provided) using "d-rings" on 2'-0" intervals. Provide bundling and tie-wrapping to "d-rings". Provide plywood backboard where "d-rings" are required when not furnished by others. All cables shall be routed neat, straight, and parallel or perpendicular to the building structure.
- L. The Contractor shall provide proper terminations and connectors for all cabling throughout the systems. Terminal wiring blocks shall be used in all cabinets, backboards, and panels. The Security Contractor shall coordinate this with the system manufacturer's requirements. The Security Contractor shall install the wiring onto the proper terminals per the system manufacturers wiring diagram furnished with the components and system shop drawings. All terminals shall be labeled and shall be reflected on the "as-built" drawings.
- M. The Contractor shall furnish and install vinyl labels installed on plastic holders and adhered to each end of each cable of the system at the components. The labels shall contain to and from information on each cable. This cable number is to be marked on an as-built single line diagram that is furnished by the Security Contractor at the completion of the project.
- N. Provide labeling for all system components. Labeling shall show component type and number as assigned to the shop drawings. Label all terminal blocks.
- O. Testing of the systems shall be the sole responsibility of the Security Contractor. The Security Contractor shall fully test all wiring and system components for proper system operation. Testing shall include, but not be limited to; short circuit, open circuit, under voltage, false detection. After the Security Contractor has thoroughly checked out the total system, the Security Contractor shall submit in writing a request for an acceptance test. Include the last punch list with request for acceptance test. It is the Contractor's responsibility at this time to demonstrate the total system to the Owner, Project Engineer, and OPM.
- P. Refer to the Drawings for further installation notes and requirements.

3.2 PROJECT RECORD DOCUMENTS (AS BUILTS)

- A. Throughout progress of the Work, maintain an accurate record of changes in Contract Documents. Upon completion of Work, transfer recorded changes to a set of Project Record Documents.
- B. The attached communication drawings shall be drafted in AutoCAD to include the following:

1. Cable routing
2. Conduit locations
3. Cable labeling number

C. Submit Project Record Documents to the engineer.

3.3 PROJECT CLOSE-OUT

- A. Prior to final inspection and acceptance of the work, remove all debris, rubbish, waste material, tools, construction equipment, machinery and surplus materials from the project site and thoroughly clean the work area.
- B. Before the Project Closeout date, the Contractor shall submit:
1. Operation and Maintenance Data.
 2. Certification and Warranties.
 3. Deliver evidence of compliance with requirements of governing authorities.
 4. Certificates of Inspection:
 - a. Low Voltage
 - b. Test Data Reports. Deliver test data in electronic format.
 - c. Project Record Documents.
- C. Project Closeout: Contractor shall submit written notice that:
1. Contract Documents have been reviewed.
 2. Project has been inspected for compliance with Contract.
 3. Work has been completed in accordance with the Contract.
- D. The Engineer will make final inspection after receipt of notice.

END OF SECTION 280000

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes the LenelS2 Net Box(TM) Security and Database Management System (SMS) consisting of computer hardware, software, and associated licensing and equipment for monitoring, recording, and managing Electronic Access Control System (EACS) and Integrated Systems (IS) data and functionality.
- B. Provide all components and licensing necessary for a complete operating system. Provide batteries, uninterruptible power supplies as required for 30 minutes full operation.
- C. The SMS includes the following sub-components:
 - 1. Operating Systems (OS) software and firmware
 - 2. Application Software
 - 3. Database Software
 - 4. Network connected Security Management Servers
 - 5. Network connected field level panels.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including:
 - 1. Related Specification Sections:
 - a. 28 00 00 Electronic Safety and Security Basic Requirements

1.3 DEFINITIONS

- A. API: Application Programming Interface
- B. AVI: Audio Video Interleave
- C. CA: Certificate Authority
- D. CAC: Common Access Card
- E. CE: European Union Conformity
- F. CPU: Central Processing Unit
- G. CSV: Comma Separated Values
- H. DNS: Domain Name Server

- I. DSM: Door Status Monitor
- J. DVR: Digital Video Recorder
- K. EACS: Electronic Access Control System
- L. FCC: Federal Communications Commission
- M. FIPS: Federal Information Processing Standard
- N. FIFO: First In – First Out
- O. FTP: File Transfer Protocol
- P. FRAC: First Responder Authentication Credential
- Q. GB: Gigabyte
- R. HTML: Hypertext Markup Language
- S. H.264, H.265: Video Compression Standards
- T. IEEE: Institute of Electrical and Electronics Engineers
- U. I/O: Input / Output
- V. IP: Internet Protocol
- W. IS: Integrated System
- X. JPEG: Joint Photographic Experts Group
- Y. LAN: Local Area Network
- Z. LDAP: Lightweight Directory Access Protocol
- AA. MB: Megabyte
- BB. MJPEG: Motion JPEG
- CC. MSATA: Mini-Serial Advanced Technology Attachment
- DD. MSP: Mobile Security Professional
- EE. MTBF: Mean-Time Between Failure
- FF. NAS: Network Attached Storage
- GG. NAT: Network Address Translation
- HH. NBAPI: NetBox Application Programming Interface

- II. NECA: National Electric Code Association
- JJ. NFPA: National Fire Protection Association
- KK. NVR: Network Video Recorder
- LL. ODBC: Open Database Connectivity
- MM. OS: Operating System
- NN. OVID: Open Video Integration Driver
- OO. PDF: Portable Document Format
- PP. PIN: Personal Identification Number
- QQ. PIV: Personal Identity Verification
- RR. PoE: Power over Ethernet
- SS. PTZ: Pan-Tilt-Zoom
- TT. RAID: Redundant Array of Independent Disks
- UU. RAM: Random Access Memory
- VV. REX: Request to Exit
- WW. RFID: Radio Frequency Identification
- XX. RoHS: Restriction of Hazardous Substances
- YY. ROM: Read Only Memory
- ZZ. RU: Rack Unit
- AAA. SFTP: Secure File Transfer Protocol
- BBB. SHA: Secure Hash Algorithm
- CCC. SIO: Serial Input / Output
- DDD. SLA: Sealed Lead-Acid
- EEE. SMS: Security Management System or Short Message Service (text messaging)
- FFF. SSL: Secure Sockets Layer
- GGG. SUSP: Software Upgrade and Support Plan
- HHH. TCP: Transmission control protocol - connects hosts on the Internet

- III. TIA: Telecommunications Industry Association
- JJJ. TLS: Transport Layer Security
- KKK. TWIC: Transportation Worker Identification Credential
- LLL. UI: User Interface
- MMM. UPS: Uninterruptible Power Supply
- NNN. UTP: Unshielded Twisted Pair
- OOO. VMS: Video Management System
- PPP. WAN: Wide Area Network
- QQQ. Wi-Fi: Wireless Network

1.4 PERFORMANCE REQUIREMENTS

- A. The SMS shall be certified to meet the following standards:
 - 1. System shall be RoHS (Restriction of Hazardous Substances) compliant and meet proposed amendments to the reduction of toxic substances in manufacturing as stated in the Environmental Design of Electrical Equipment Act (EDEE)
 - 2. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency and marked for intended location and application.
 - 3. Installation shall comply with NEC/NFPA 70E "Standard for Electrical Safety in the Workplace".
 - 4. Electronic data exchange between Video Surveillance System and an Access Control System shall comply with SIA TVAC
 - 5. Installation shall comply with FCC CFR 47 Part 15 Class A "Telecommunications, Radio Frequency, Digital Device Emission".
 - 6. Installation shall comply with federal, state, and local codes and Authority Having Jurisdiction (AHJ).

1.5 ACTION SUBMITTALS

- A. Product Data: Provide details and technical specifications for each product indicated. Include physical dimensions, features, performance, electrical characteristics, ratings, software versions, and operating system details.
- B. Shop Drawings: Include system line diagrams, equipment locations, installation details, and system integration plans.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 2. Functional Block Diagram: Show single-line interconnections between components for signal transmission and control. Show cable types, quantities, and sizes.
 3. Plans and Elevations: Dimensioned plans and elevations of equipment racks, enclosures, and conduit interconnections, including access and workspace requirements.
 4. Data Calculations: Provide data bandwidth and storage calculations, including data backup and archive configuration details meeting the minimum project requirements as described herein.
 5. Power and Heat Load Calculations: Provide power and heat load calculations for all hardware, including UPS capacity calculations.
 6. Wiring Diagrams: For power and signal wiring.
- C. Equipment and Software List: Include every piece of equipment and software by product/model name and/or number, manufacturer, serial number, revision number, location, and date of original installation. If factory and/or bench testing regimens are required by the project plan, add pretesting record of each piece of equipment and software, listing name of person testing, date of test, and adjustments made.

1.6 INFORMATIONAL SUBMITTALS

- A. CE and FCC Compliance Certificates.
- B. Field quality-control reports.
- C. Current LenelS2 Integrator Certification Letter.
- D. Current LenelS2 Training Certificates (listing expiration dates) for technicians from the supporting office.
- E. Warranty: Software support and warranty information for all components, including Service Level Agreement (SLA) details, and duration of agreement from date of system acceptance by Owner.

1.7 CONTRACTOR REQUIREMENTS

- A. The Contractor shall have a supporting office within 50 miles of the project location.
- B. Certifications: Two technicians from the supporting office shall hold current certifications with LenelS2.
- C. On-site Contractor personnel shall hold all required local, state, and federal licenses.
- D. On-site Contractor personnel shall hold current certifications with LenelS2.
- E. The Contractor shall provide three references for completed projects of similar scope.

1.8 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For all components and software to include in emergency, operation, and maintenance manuals.
 - 1. Extra Materials:
 - a. Return all left-over (unused) product and materials to the Owner.
 - 2. Applicable operating system, database, client, and application software on portable storage media.
 - 3. Full System Backup as of closeout date on portable storage media.
 - 4. Submit one (1) printed and one (1) electronic copy of project binder in final form. This copy shall contain as a minimum:
 - a. Table of Contents for each element
 - b. Contractor information - names phone numbers, and email for sales, technical support, and consumables reordering.
 - c. Lists of spare parts and replacement components recommended to be stored at the site for ready access.
 - d. Datasheets for all equipment
 - e. Operation and maintenance manuals for all equipment
 - f. Operation and maintenance procedures not covered in manufacture's manuals.

1.9 QUALITY ASSURANCE

- A. The installation shall comply with federal, state, and local codes and Authority Having Jurisdiction (AHJ).
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. All software and hardware shall be programmed and installed in accordance with the manufacturer's specifications.
- D. All equipment shall be new, in current production, and the standard products of a manufacturer of ESS equipment.
- E. The manufacturer shall guarantee availability of parts for a minimum of five years from date of shipment.
- F. The contractor shall review drawings and specifications.

1.10 PERMITS

- A. All permits required for the specified performance and completion of the work shall be secured by the Contractor.

1.11 PROJECT CONDITIONS

- A. Environmental Conditions: System components shall withstand the following environmental conditions without mechanical or electrical damage or degradation of operating capability:
 - 1. Interior Environmentally Controlled Space: Rated for continuous operation in ambient temperatures of 32° to 95° F (0° to 35° C) dry bulb and a relative humidity of 20 to 80 percent, noncondensing.

1.12 WARRANTY

- A. Manufacturer's standard form in which manufacturer agrees to service, repair or replace system components as needed for proper system operation as specified herein.
- B. Warranty Period: a 2-year warranty on hardware and a 1-year warranty on labor from date of date of Owner Acceptance.

PART 2 PRODUCTS

2.1 OPERATIONAL REQUIREMENTS

- A. The SMS shall be implemented through network appliance architecture with a three-tier modular hardware hierarchy and embedded three-tier software architecture.
 - 1. The network appliance shall be capable of running on an existing TCP/IP network and shall be accessible, configurable, and manageable from any network-connected PC with a browser.
 - 2. Browser access for configuration and administration of the system shall be possible from a PC on the same subnet, through routers and gateways from other subnets, and from the Internet. Control and management of the system shall therefore be geographically independent.
 - 3. Security of the data communicated over the network to and from the browser, Network Controller, and field panels shall be protected by TLS protocol encryption. The connection shall use TLSv1.3, GCM mode, and a 2048-bit RSA key.
 - 4. The top hardware tier shall be the Network Controller. Embedded on the Network Controller shall be an operating system, a web server, security application software, and the database of personnel and system activity. Converged Video Access systems shall also include a fully functional network video recorder.

5. The middle hardware tier shall be the Network Node. The Network Node shall make and manage access control decisions with data provided by the Network Controller, and it shall manage the communication between the Network Controller and Application Blades connected to the system's inputs, outputs, and readers. This modular design shall make it possible, even during network downtime, for the system to continue to manage access control and store system activity logs. When network connectivity is re-established, the system activity logs shall be automatically re-integrated.
6. The bottom hardware tier shall be the Application Blades. Four unique Application Blades shall be available:
 - a. Access Control Blade: shall support two readers, four supervised inputs, and four relay outputs.
 - b. Alarm Input Blade: shall support eight supervised inputs.
 - c. Relay Output Blade: shall support eight relay outputs.
 - d. Temperature Blade: shall support eight analog temperature sensor inputs.
- B. All equipment and materials used shall be standard components, regularly manufactured, and regularly utilized in the manufacturer's system.
- C. All LenelS2 systems and components shall have been thoroughly tested and proven in actual use.
- D. Security Management System Software: Existing.

2.2 HARDWARE REQUIREMENTS

- A. The SMS shall employ a modular hardware concept that enables simple system expansion and utilizes a three-tiered hardware hierarchy:
 1. At the top tier is the Network controller. Network controller is existing.
 2. At the second tier is the Network Node, an intelligent device with native TCP/IP support, which shall make and manage access control decisions.
 3. At the third tier are the application extension blades. Each of these blades shall connect to and manage a set of inputs, outputs, readers, or temperature monitoring points.
 4. The Network Controllers and Network Nodes shall run on existing building TCP/IP networks and shall be configurable for access from separate subnets, through gateways and routers and from the Internet.
 5. A MicroNode Plus(TM), which combines an Access Control blade and a Network Node, shall also be available.

- B. The LenelS2 application blades shall interface with the Network Controller through the Network Node. The application blades shall be blade-style circuit cards. There shall be four types of application blades:
1. LenelS2 access control blade - The access control blade shall receive power via the ribbon cable bus directly from the Network Node blade. The access control blade shall supply up to 500 mA of power to one reader or 250 mA of power to each of two readers. The new generation access control blade shall allow the user to select OSDP or Wiegand reader configurations. An OSDP configuration shall support data encryption between the OSDP readers and the blade.
 2. Reader Connectors 2
 3. Max Reader Cable Length 500 feet (152m) (18 AWG twisted, shielded)
 4. Reader Power 500 mA
 5. Input Connectors 4
 6. Max Input Cable Length 2000 feet (610m) (22 AWG twisted, shielded)
 7. Output Connectors 4
 8. LenelS2 input blade - The input blade shall receive power via the ribbon cable bus directly from the Network Node blade. It shall support a wide variety of input supervision types including normally-open circuit and normally-closed circuits, and zero, one or two resistor configurations.
 9. Input Connectors 8
 10. Max Input Cable Length 2000 feet (610m) (22 AWG twisted, shielded)
 11. Supervision Types 4 (open, closed, normal, alarm)
 12. LenelS2 output blade - The output blade shall receive power via the ribbon cable bus directly from the Network Node blade. Both normally-open circuit and normally-closed circuit output devices shall be supported. The relay outputs shall support any output devices that operate on the following maximum electrical ratings: 30 Volts DC or AC, 2.5 Amps inductive or 5.0 Amps non-inductive.
 13. Output Connectors 8
 14. Contact Type Form C
 15. Max Electrical Ratings 30 Volts DC, 2.5 Amps Inductive, 5.0 Amps non-inductive.

16. LenelS2 temperature blade - The temperature blade shall receive power via the ribbon cable bus directly from the Network Node blade.
 17. Temperature Inputs 8
 18. Max Temperature Cable Length 1000 feet (305m) (18 AWG twisted, shielded)
 19. Temperature Range 32° to 158° F (0° to 70° C)
- C. Each MicroNode Plus(TM) shall function as a node and as an access control blade. In addition, each MicroNode Plus shall support one temperature input. The MicroNode Plus may be supplied with 12VDC at 5 amps. With a 12VDC 5A power supply the total power available for all external output is 2000mA (24 watts). Alternatively, it shall also be possible to power the MicroNode Plus from PoE switch that conforms to the IEEE 802.3af standard, or from PoE Plus switch which conforms to the IEEE 802.3at standard. With PoE (802.3af) as the power source the total power available for all external 12V output is 500mA (6 watts @12VDC). With PoE Plus (802.3at) as the power source the total power available for all external 12V output is 1000mA (12 watts @ 12VDC).
1. Access Control Readers 2
 2. Access Levels 512
 3. Portals 2
 4. Portal Groups 64
 5. Reader Groups 256
 6. Supervised Inputs 4
 7. Input Groups 64
 8. Relay Outputs 4
 9. Output Groups 64
 10. Temperature Inputs 1
 11. Elevators 2
 12. Floors 4
 13. Floor Groups 128
 14. Time spec groups 64
 15. Credential storage 150,000

16.	Activity Log records	800,000
17.	Max Reader Cable Length	500 feet (152 m) (18 AWG twisted, shielded)
18.	Input Connectors	4
19.	Max Input Cable Length shielded)	2000 feet (610 m) (22 AWG twisted, shielded)
20.	Output Connectors	4; 2 wet / dry selectable
21.	Temperature Inputs	1
22.	Max Temperature Cable Length shielded)	1000 feet (305 m) (18 AWG twisted, shielded)
23.	OS	Linux
24.	Ethernet Ports	1
25.	MTBF	297,000
26.	Dimensions (H, W, D)	11.34in x 8.0in x 2.57in (28.80cm x 20.32cm x 6.53cm)
27.	Weight	3.2 lbs (1.45 kg)
28.	Operation Temperature	32° to 95° F (0° to 35° C)
29.	Storage Temperature	-40° to 158° F (-40° to 70° C)
30.	Relative Humidity	90% non-condensing
31.	MTBF	297,000
32.	Btu/h	204

D. All wall-mount enclosures shall have a lock requiring a key, and a cabinet door tamper switch.

2.3 CARD READERS

- A. Contactless smartcard reader, multi-technology, single gang
- B. HID Signo Reader 40; Part number 40NKS-00-000000.

2.4 DOOR POSTION SWITCHES

- A. Magnetic contacts, encapsulated reed switches and separate magnet to monitor door position.

2.5 REQUEST TO EXIT

- A. Door hardware with integral Request to Exit switches. Coordinate and comply with Division 08 door hardware schedule.
- B. Motion Sensors: Passive Infrared.

2.6 VIDEO INTERCOM

- A. Power over Ethernet with integral video camera and microphone. 2N IP solo, no substitutions.

2.7 CABLE

- A. OSDP, RS485, jacket rating as required.

2.8 ACCESS CONTROL POWER SUPPLIES

- A. Altronix: Lock power to be isolated from the control board by removable fuse and relay or fuse and relay distribution board.
- B. Battery Backup:
 - 1. Built in charger for sealed lead acid or gel type batteries
 - 2. Automatic switch over to stand-by when AC fails. Transfer to stand-by battery power is to be instantaneous with no interruption.
 - 3. Battery to be sized to provide 12-hours operation after loss of AC power.
 - 4. Label batteries with date of installation.
 - 5. Provide battery calculations to OCC for approval prior to ordering materials.
 - 6. Manufacturers: Interstate or approved equivalent.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine cable pathways including conduit, raceways, cable trays, and other pathway elements for compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting installation.
- B. Examine rough-in for control cable and conduit systems to controllers, card readers, and other system components to verify conduit and back-box locations prior to installation of system devices.
- C. Examine available network capacity and support infrastructure. Consult with network administrator for compliance with network standards and capacity.

- D. Examine install location for compliance with space allocations, installation tolerance, hazards to safe system operation, and other conditions affecting installation.
- E. Examine roughing-in for LAN, WAN, and IP network before device installation.

3.2 PREPARATION

- A. Comply with SIA CP-01 Control Panel Standard.
- B. Comply with ANSI/TIA-606-B Labelling Standard.
- C. Prepare detailed project planning forms for programming and configuration of the SMS. Fill in all data available from project plans and specifications and publish as project planning documents for review and approval. These may include (but are not limited to):
 - 1. Define SMS Partitions.
 - 2. For each Location, record setup of Network Controller features and access requirements.
 - 3. Set up groups, facility codes, software triggers, and list inputs and outputs for each Network Controller.
 - 4. Assign action message names and compose messages.
 - 5. Prepare and install alarm graphic maps.
 - 6. Develop user-defined fields.
 - 7. Complete system diagnostics and operation verification.
 - 8. Prepare a specific plan for system testing, startup, and demonstration.
 - 9. Develop acceptance test concept and, on approval, develop specifics of the test.
 - 10. Develop cable and asset-management system details; input data from construction documents. Include system schematics and technical drawings in electronic format.
- D. In meetings with Architect and Owner, present Project planning documents and review, adjust, and prepare final programming and configuration documents. Use final documents to program and configure software.

3.3 CABLING

- A. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters. Conceal raceway and wiring except in unfinished spaces.
- B. Adhere to requirements in specification 27 15 00 for all Category 6 cabling.

- C. Junction boxes and enclosures containing security-system components or cabling, and which are easily accessible to employees or to the public, shall be provided with tamper resistant fasteners and/or tamper detection switches. In addition, hinged enclosure doors shall be equipped with locking hardware. Boxes above ceiling level in occupied areas of the building shall not be considered accessible. Junction boxes and small device enclosures below ceiling level and easily accessible to employees or the public shall be covered with a suitable cover plate and secured with tamperproof screws.
- D. Install end-of-line resistors at the field device location and not at the controller or panel location.
- E. Card Readers and Keypads and Peripheral Devices:
 - 1. Install number of conductor pairs recommended by device manufacturer for the functions specified.
 - 2. Follow device manufacturer's installation requirements for maximum cable distances and sizes.

3.4 IDENTIFICATION

- A. Label, in plain English, each end of each cable, field panel, patch panel, network switch, or cabinet.
 - 1. Each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with the name and number of the device as shown.
- B. At completion, cable and asset management documentation shall reflect as-built conditions.

3.5 SYSTEM SOFTWARE AND HARDWARE

- A. Develop, install, and test software and hardware, and perform database tests for the complete and proper operation of systems involved.
- B. Assign the software license(s) to Owner.
- C. All default passwords shall be changed to those selected by the owner.
 - 1. The contractor shall retain no records of passwords for the project.

3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Factory Commissioning: Onsite visit by the Manufacturer's in-house personnel to inspect, test, and assess system programming, functionality, and performance.
- C. Tests and Inspections:
 - 1. Inspection: Confirm that units and controls are properly installed, connected, and labeled, and that interconnecting wires and terminals are identified.

2. Pretesting: Configure and pretest system components, wiring, and functions to confirm that they comply with specified requirements.
 3. Operational Test: After installation of cables and connectors, demonstrate product capability and compliance with requirements.
 4. Test Schedule: Schedule tests after pretesting has been successfully completed and system has been in normal functional operation for at least <14 days>. Provide a minimum of 10 days' notice of test schedule.
 5. Operational Tests: Perform operational system tests to confirm that the system complies with Specifications. Include all modes of system operation. Test equipment for proper operation in all functional modes.
- D. The system is considered defective and the project incomplete if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

3.7 STARTUP SERVICE

- A. Engage a factory-authorized service representative to supervise and assist with startup service.
- B. Provide onsite visit by Manufacturer's in-house personnel to train Owner's operations personnel.
- C. Complete installation and startup checks according to approved procedures that were developed in "Preparation" Article and with manufacturer's written instructions.

3.8 ADJUSTMENTS

- A. Occupancy Adjustments: When requested within 30-days of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project for this purpose. Tasks shall include, but are not limited to, the following:
- B. Check cable connections.
- C. Confirm system configuration and adjust settings needed.
- D. Recommend changes to the system to improve Owner's use.
- E. Provide a written report of adjustments and recommendations.

3.9 MAINTENANCE

- A. The Contractor shall offer a Software Upgrade and Support Agreement (SUSP)
 1. As part of the agreement, normal business hours (9:00 AM – 6:00 PM), manufacturer phone support shall be available.

2. The option of 24/7 telephone support shall be offered.
3. As part of the agreement, access to software patches and software upgrades shall be available.

END OF SECTION 281000