



**PROJECT MANUAL**



**INTERIOR ALTERATIONS**

**VOLUME 1 of 1**

May 6, 2022



202100475

**PROJECT MANUAL**



#438 SOUTH HILL MALL  
Puyallup WA

Interior Alterations

May 6, 2022

**OWNER** MACY'S INC.  
MACY'S CORPORATE SERVICES, INC.  
145 Progress Place  
Springdale OH 45246

**PROJECT** MACY'S #438 SOUTH HILL MALL  
SOUTH HILL MALL  
3500 S Meridian Ste. 985  
Puyallup, WA 98373

**ARCHITECT** ANDREW C. HARTE ARCHITECT  
16 East 12th Street  
Cincinnati OH 45202-7202

**MECHANICAL AND ELECTRICAL** PRATER ENGINEERING ASSOCIATES, INC.  
6130 Wilcox Road  
Dublin OH 43016

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## DOCUMENT 00 26 00 - PROCUREMENT SUBSTITUTION PROCEDURES

### 1.1 DEFINITIONS

- A. Procurement Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Procurement and Contracting Documents, submitted prior to receipt of bids.
- B. Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Contract Documents, submitted following Contract award.
  - 1. See Division 01 Section "Substitution Procedures" for conditions under which Substitution requests will be considered following Contract award.

### 1.2 QUALITY ASSURANCE

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

### 1.3 PROCUREMENT SUBSTITUTIONS

- A. Procurement Substitutions, General: By submitting a bid, the Bidder represents that its bid is based on materials and equipment described in the Procurement and Contracting Documents, including Addenda.
- B. Qualifying Substitutions: Bidders are encouraged during procurement to request review of qualifying substitute materials and equipment when the Specifications Sections list materials and equipment by product or manufacturer name.
- C. Procurement Substitution Requests will be received and considered by Owner when the following conditions are satisfied, as determined by Architect; otherwise requests will be returned without action:
  - 1. Extensive revisions to the Contract Documents are not required.
  - 2. Proposed changes are in keeping with the general intent of the Contract Documents, including the level of quality of the Work represented by the requirements therein.
  - 3. The request is fully documented and properly submitted.
- D. Entirety of Work: Bidder, in submitting the Procurement Substitution Request, waives the right to additional payment or an extension of Contract Time because of the failure of the substitute to perform as represented in the Procurement Substitution Request.
- E. Performance: Bidder, in submitting the Procurement Substitution Request, certifies that the substitute as represented in the Procurement Substitution Request will meet or exceed requirements of the Contract Documents, including performance and other criteria established for the original product, material, or installation specified.

### 1.4 SUBMITTALS

- A. Procurement Substitution Request: Submit to Architect in PDF format. Procurement Substitution Request must be made in writing by prime contract Bidder only in compliance with the following requirements:
  - 1. Requests for substitution of materials and equipment will be considered if received no later than 5 days prior to date of bid opening.

2. Submittal Format: Submit using form bound in Project Manual.
  - a. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specifications Sections and Drawing numbers.
  - b. Provide complete documentation on both the product specified and the proposed substitute, including the following information as appropriate:
    - 1) Point-by-point comparison of specified and proposed substitute product data, fabrication drawings, and installation procedures.
    - 2) Copies of current, independent third-party test data of salient product or system characteristics.
    - 3) Samples where applicable or when requested by Architect.
    - 4) Detailed comparison of significant qualities, performance, and other characteristics of the proposed substitute with those of the Work specified. Significant qualities may include attributes such as performance, durability, suitability to application and conditions of service, energy consumption, sustainable design characteristics, weight, size, clearances, visual effect, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    - 5) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    - 6) Research reports, where applicable, evidencing compliance with building code in effect for Project, from ICC-ES where applicable.
    - 7) Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, which will become necessary to accommodate the proposed substitute.
  - c. Provide certification by manufacturer that the substitute proposed is equal to or superior to that required by the Procurement and Contracting Documents, and that its in-place performance will be equal to or superior to the product or equipment specified or shown.

#### 1.5 ARCHITECT'S ACTION

- A. Architect's Action: Owner and Architect will review request.
  1. Architect may request additional information or documentation necessary for evaluation of the Procurement Substitution Request. Owner and Architect will notify all prime contract Bidders of acceptance of the proposed substitute by means of an Addendum to the Procurement and Contracting Documents.
- B. Architect's Review: Architect's review of a Procurement Substitute Request during bidding does not relieve Contractor of the responsibility to submit required Product Data, Shop Drawings, and Samples, and to comply with all other requirements of the Contract Documents.

#### 1.6 ACCEPTANCE OF SUBSTITUTION

- A. Changes to Contract: Procurement substitutes may only be included in the Work if included in the original Contract, or if held for later Owner acceptance, by appropriate modification of the Contract.
- B. Compensation: In the event a Procurement Substitution is accepted, the change in Contract Sum shall be the sole and only compensation for the substitute. No additional compensation will be allowed for any reason.

END OF DOCUMENT 00 26 00

DOCUMENT 00 31 19 - EXISTING CONDITION INFORMATION

1.1 EXISTING CONDITION INFORMATION

- A. General: This Document with referenced attachments, if any, is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of the Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.
  - 1. Opinions and interpretations expressed are those of the respective authors or preparers of that information. Owner and Architect are not responsible for interpretations or conclusions drawn.
  - 2. Owner and Architect are not responsible for characterizations of construction, including but not limited to, accuracy; actual locations; extent, presence or absence of features, systems, subsystems, components, equipment, assemblies, members, bearings, routing and distribution, other physical attributes, characteristics, or features, or environmental or other assessments.
- B. Availability: Existing conditions information including previous construction at Project site, if available, may be requested from the Owner for viewing.
  - 1. Owner's making available existing conditions information, if any, fulfills Owner's disclosure obligations concerning Project.
- C. Examination and Review of Site: Examine available information, if any, and review site prior to submitting Bids.
  - 1. No changes to the Contract Sum or Contract Time (Duration) will be made due to failure to examine the site and available existing conditions information, if any.

END OF DOCUMENT 00 31 19



REQUEST FOR CONSIDERATION OF SUBSTITUTION

TO BE COMPLETED BY CONTRACTOR PROPOSING SUBSTITUTION

Attach Supplemental Documentation; Use Separate Forms for Each Request

Project Name:

Contractor Submitting Request:

Date of Issue:

Requested Reply Date:

SUBMISSION FOR:

Cause     Convenience     Other (Describe) \_\_\_\_\_

CONTRACTOR'S REQUEST FOR CONSIDERATION OF SUBSTITUTION  
(Attach Supporting Information behind Form)

SUPPORTING INFORMATION SUBMITTED BY CONTRACTOR

Check All That Apply

- |   |      |         |
|---|------|---------|
| <input type="checkbox"/> Project Manual Section                           | Page | Article |
| <input type="checkbox"/> Drawings (Include References)                    |      |         |
| <input type="checkbox"/> Test Data, Third Party or Manufacturer Certified |      |         |
| <input type="checkbox"/> ICC-ES Reports                                   |      |         |
| <input type="checkbox"/> Other (Attach Other Information)                 |      |         |

Manufacturer:

Brand Name:

Model/Line/Series or Other Identifying Information:

Reason Specified Products Are Not Used (Describe):

COMPARISON WITH ORIGNALLY SPECIFIED PRODUCT

Codes and Standards: Substitution Complies with Codes and Standards in Effect?

Yes-Attach Complete Data     No-Substitution Not Permitted     Not Required to Comply

Accessibility Codes and Standards: Substitution Complies with Accessibility Codes and Standards in Effect?

Yes-Attach Complete Data     No- Substitution Not Permitted     Not Required to Comply

Fire Resistance: Substitution Complies with Fire Resistance /Flammability Indicated?

Yes-Attach Complete Data/Rating     No-Substitution Not Permitted     Not Required to Comply

Suitability and Compatibility: Substitution Suitable and Applicable for Actual Project Conditions?

Yes-Attach Complete Data     No-Substitution Not Permitted

Lateral Forces or Seismic Resistance: Substitution Complies with Project Requirements?

Yes-Attach Complete Data/Calcs       No-Substitution Not Permitted       Not Required to Comply

Dimensional Criteria: Substitution Complies with Dimensions/Weights/Loads/Clearances Indicated or Required?

Yes-Explain; Attach Data       No-Substitution Not Permitted       Varies-Explain

Other Performance: Substitution Complies with Performance Requirements/Criteria Indicated or Required?

Yes-Explain; Attach Data       No-Substitution Not Permitted       Not Required to Comply

Other Construction: Substitution Affects Other Construction (i.e., Structure, Envelope, Systems, Finishes, etc.)?

Yes-Explain; Attach Data; List All Construction/Systems Affected       No-Explain

Environmental Impact: Substitution Complies with Temperature/Humidity/Environmental Criteria Indicated?

Yes-Attach Data       No-Explain       Varies-Explain

Warranties: Substitution Complies with Warranty and Special Warranty Requirements Indicated?

Yes-Attach Data       No-Explain       Varies-Explain

Availability: Substitution Delivery and Installation Complies with Project Schedule and Contract Time?

Yes-Attach Schedule for Substitution       No-Substitution Not Permitted

By attaching supporting information, the Undersigned certifies it has included product description and performance criteria along with other corroborating and supporting information adequate to evaluate the request, that applicable portions of data relevant are clearly identified, and includes changes necessary to carry out the Substitution.

PROPOSED CREDIT TO OWNER

\$ .00 (Written in Dollars and Cents):

The Undersigned, having authority to execute this Substitution and having examined the Contract Documents and conditions affecting the Substitution proposed, certifies:

- Proposed substitution has been fully investigated and determined to meet or exceed Project requirements and specified product.
- Proposed substitution includes all work necessary to ensure the Work is complete and functions and performs correctly and as originally designed.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule, and not require extension of the construction schedule
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution that may subsequently become apparent are to be waived, including any future claims.
- Proposed substitution does not affect dimensions and functional clearances.
- Contractor remains responsible for any changes to building design, including architectural, structural, consulting, or other engineering design, detailing, and permits caused by the substitution unless waived by Owner in writing.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.
- Contractor remains solely responsible for performance of substitution and any and all costs required to remedy defects and deficiencies, or to make substitute perform to meet product originally designed.

Signature

Printed Name and Title

Date

ARCHITECT'S REVIEW OF SUBSTITUTION REQUEST AND ACTION

- Substitution Reviewed with Comments: Restrictions or conditions for substitution's use indicated; submit for use in accordance with Division 01 Section "Submittal Procedures."
- Substitution Reviewed, Revise and Resubmit: If time permits, revise and resubmit information to satisfy comments indicated.
- Substitution Rejected; Substitution not permitted; use originally specified product.
- Substitution Not Received in Timely Manner; Substitution not permitted; use originally specified product.
- Furnish Additional Information and Resubmit for Consideration. Information to Include:

Restrictions/Conditions for Use of Substitution:

For Architect:

---

Signature

Printed Name

Date



REQUEST FOR RELEASE OF DIGITAL DATA

TO BE EXECUTED BY CONTRACTOR

Agreement must bear signature of legally authorized signatory for General Contractor. Form is comprised of 2 pages

CONTRACTOR SUBMITTING REQUEST

Project:  
Contractor:  
Address:  
Email:

CONSENT TO CONDITIONS TO RELEASE DIGITAL DATA

The undersigned, having the authority to legally obligate and bind the General Contractor, its contractors and sub-contractors, suppliers, and others engaged by it in the Work (hereinafter collectively referred to as the Contractor), enters into this Agreement on the date indicated below for digital data made available by the Architect, Andrew C. Harte Architect, its consultants and sub-consultants (hereinafter collectively referred to as the Architect), subject to Contractor's acceptance of all terms and conditions of this Agreement.

The Contractor acknowledges and accepts (a) this is the entire Agreement between parties, (b) the Architect grants a non-exclusive limited license to use the digital data for the Contractor's sole use for the Project indicated, and other uses or purposes are prohibited, (c) all drawings, specifications, field data, notes, reports, or other documents included in digital data are instruments of service prepared by the Architect and remain the property of the Architect, including all legal, statutory, and other reserved rights, including copyrights, (d) to the fullest extent permitted by law, the Contractor shall indemnify, hold harmless, and defend the Architect from any and all claims, including cost of defense, arising from or related to the digital data furnished, and the Contractor waives any and all claims against the Architect, (e) the Contractor agrees to keep digital data confidential and not to disclose to any person or entity, other than the Contractor and subcontractors, confidential data contained in the digital data, (f) no warranties or guarantees of any kind are made, either express or implied, including warranties of merchantability or fitness for a particular use, (g) no representation of any kind is made as to the completeness or accuracy of any digital data furnished, nor any representation it is without defect or error, and that differences may exist Contract Documents, printed documents, and digital data furnished, (h) this Agreement does not constitute a sale of any kind, (i) the Contractor shall be solely responsible for verification of all information contained within digital data, (j) digital data is furnished in the Architect's digital format without modification and without technical support, (k) the Contractor may not assign this Agreement, (l) the Architect may, for due cause or violation of any of the terms or conditions of this Agreement, terminate this Agreement, (m) the Contractor may terminate this Agreement at any time by destroying all copies of the digital data and any instruments or products generated from that data, and by notifying the Architect in writing of Contractor's termination, (n) notwithstanding completion or termination of this Agreement for any reason, all rights, duties and obligations of the parties to this Agreement shall survive such completion or termination and remain in full force and effect until fulfilled, (o) nothing contained in this Agreement shall created a contractual relationship with or a cause of action in favor of the Contractor or third party against the Architect, (p) Ohio law governs this Agreement.

If any term or provision in this Agreement is held to be invalid or unenforceable under any applicable statute or rule of law, such holding shall only be applied to the provision so held, and the remainder of this Agreement shall remain in full force and effect.

For the Contractor:

---

Signature Printed Name and Title Date



# Lock Information Sheet

 Send completed order forms to [macys@bass-security.com](mailto:macys@bass-security.com)

**Vendor Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
**Vendor Purchase Order #:** \_\_\_\_\_ **Change Order:**  YES  NO **Bass W/O #:** \_\_\_\_\_  
**Billing Address:** \_\_\_\_\_  
 (Street) (City) (ST) (ZIP)  
**Phone:** \_\_\_\_\_ **FAX:** \_\_\_\_\_ **EMAIL:** \_\_\_\_\_  
**Shipping Address:** \_\_\_\_\_  
 (Street) (City) (ST) (ZIP)

**Macy's Store Information Section (Send one form per location)**

**Brand/Family of Business:** \_\_\_\_\_ **Store # & Name:** \_\_\_\_\_  
**Store Address:** \_\_\_\_\_  
 (Street) (City) (ST) (ZIP)  
**Macy's On Site Contact:** \_\_\_\_\_  
 (Leave Blank if not known) (Name) (Phone) (Email)  
**Type of Project**  New Store  Remodel  Specialty Roll-Out  Other: \_\_\_\_\_

*\*Locks/Housings will be sent to the Fixture Vendor. Bass Security will coordinate with Macy's Loss Prevention Dept. regarding the shipping of the Keys/Cores*

Fixture Type Description	Applica- tion Type	Date Required	Lock Type 3L, 5L, 2S (Use a 1C Core)	4S Locks (Use a 6C core)	***Finish	Lock Quantity	Core Quantity (By Macy's)	Key Quantity (By Macy's)	Core Marking (By Macy's)	Permanent Core Keyway (By Macy's)

**If additional lines are needed check this box**  **and continue entering on page 2.**

**Standard Finish Types:** 605=Bright Brass 606=Satin Brass 625=Bright Chrome 626=Satin Chrome 622=Flat Black  
 \*\*\*Orders requesting special finishes will have a longer lead time. Call Bass Security for for timing

**Application Type:** PRM=Perimeter BI=Back Island ID=Interior Doors FD=Store Front Doors CW=Cash Wrap SD=Shell Door  
 LW=Loose Wood ID=Interior Doors FD=Store Front Doors CW=Cash Wrap SDT=Stockrm (Trilogy) Door DTX=Detex





## **OEM Guide**

**October 2016**

For Questions Call  
Bass Security Services Inc.  
866-794-2338  
Email: [macys@bass-security.com](mailto:macys@bass-security.com)

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## First Time Vendors

Vendors engaging in business with Bass Security Services, Inc. for the first time must go through an initial set up process based on the payment method selected: Open Terms or Prepayment.

1. Requirements for establishing an Open Credit Terms account with Bass Security:
  - a. Credit Application (*located on page 34*) must be completed and submitted per instructions listed on application.
  - b. A minimum of 2 business days are required to process credit applications once received.
  - c. If sales tax exempt, Certificate of Exemption is required for each state materials will be shipping to and must accompany credit application.
2. Requirements for establishing Prepayment (credit card/check) for orders placed with Bass Security Service
  - a. Credit Card
    - i. If prepaying via a Company Credit Card, the credit card authorization form (*located on page 35*) must be completed and submitted per instructions on form.
    - ii. Once credit card payment has been confirmed, a receipt will be sent to the customer and order processing will begin.
  - b. Company Check
    - i. For expedited processing, payments can be sent via Next Day Air to: Bass Security Services, Inc., Attn: Accounts Receivable, 345 Mason Rd, LaVergne, TN 37086.
    - ii. Once payment has been received, the customer will be notified and order processing will begin.
  - c. Sales tax exempt, certificate of exemption must be received with prepayment for each state materials will be shipped to.

**\*\*\*ADDITIONAL CREDIT APPLICATION or CREDIT CARD AUTHORIZATION FORMS CAN BE OBTAINED BY CONTACT ING THE MACY'S TEAM AT [macys@bass-security.com](mailto:macys@bass-security.com)**

All orders will be shipped via UPS Ground and shipping charges will be invoice.  
Vendors requesting to use 3<sup>rd</sup> Party freight accounts may incur set up costs. Please contact [Macys@bass-security.com](mailto:Macys@bass-security.com) or call 866-794-2338 for more information

## National Accounts Call Center (NACC)

The NACC provides customer service and support to designated National Account Customers with centralized contacts for placing product orders for mechanical locking hardware, safes, cores and keys, and service on mechanical locking hardware of all brands along with safe service. The customer support teams at the NACC are available to provide answers to any needs raised by our customers.

### Support Team Contact Information

\*\*For material quotes, order placement, order status, lead time, etc.

- Macy's is assigned to 'Team 935' for customer support purposes
  - ✓ Email: [macys@bass-security.com](mailto:macys@bass-security.com)
  - ✓ Phone: 866-794-2338
  - ✓ Address: 26701 Richmond Rd, Cleveland, OH 44146

### After Hours Communications

Should after hours communication be needed, please dial the assigned support number, 866-794-2338 and the call will be routed to our answering service. After hours communication is generally between 5:00pm and 7:00am Eastern Standard Time on week days and all day on weekends. Your call will be returned the following business day.

### Escalation Process

Should you need to escalate a question/issue; the following path will provide the fastest resolution:

Macy's Customer Service Team	Team 935	866-794-2338
*Call this number for new requests	& ALL follow up *	866-794-2338
Project Manager	LaKia Wallace	888-774-3400 ext. 1253
NACC Customer Service Manager	Jessica Hines	888-774-3400 ext. 1172

### Order Process

The cabinet manufacturer will email a completed 'Lock Information Sheet' (*located on page 36*) and a purchase order/payment method to Bass Security Services, Inc. National Accounts Call Center (NACC) at [macys@bass-security.com](mailto:macys@bass-security.com). The Lock Information Sheet must be 100% complete. For questions regarding the form contact the Macy's team with Bass Security Services, Inc. at 866-794-2338 or email [macys@bass-security.com](mailto:macys@bass-security.com) with your questions.

Upon receipt of the completed "Lock Information Sheet" and Purchase Order/payment, Bass Security Services, Inc. NACC will process the order to ship the lock housing units directly to the Cabinet Manufacturer by the



required delivery date. Bass Security Service, Inc. NACC will work directly with Macy's, per their requirements, to deliver the permanent cores and keys to the store site.

Standard lead time for all orders is 4 weeks. Please note that for large orders and special finishes, lead-time may be longer than 4-weeks. Any lead-time questions prior to placing an order, may be obtained by calling the dedicated Macy's customer support team at 866-794-2338 or emailing [macys@bass-security.com](mailto:macys@bass-security.com)

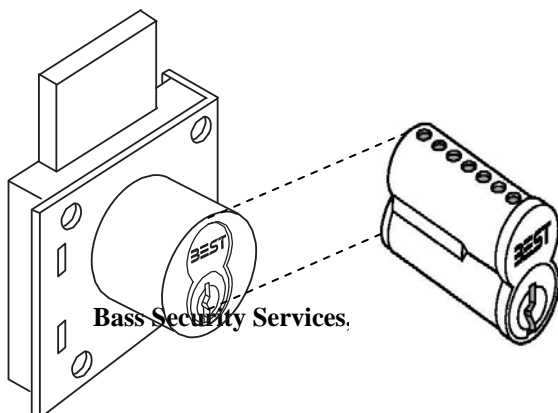
If the cabinet manufacturer would like to be notified when lock orders have shipped, an email request including the Purchase Order# and return email address should be sent to [macys@bass-security.com](mailto:macys@bass-security.com).

**\*\*Electronic version of the 'Lock Information Sheet' can be obtained by contacting the Macys Team at [macys@bass-security.com](mailto:macys@bass-security.com)**

For Lock templates, installation instructions please refer to [www.BestAccess.com](http://www.BestAccess.com)

### 3L Series

- Requires an I/C 7 pin core
- Refer to dimensional drawing L08A

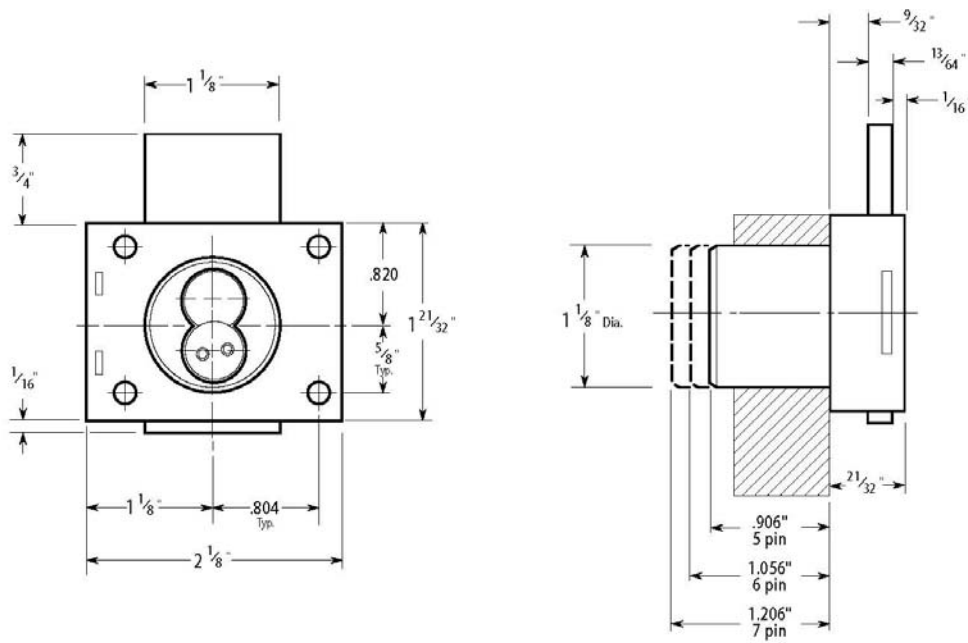


1C 7 Pin Core

3L Deadbolt-Vertical Only

**How to order**

Series	Core	Mounting	Latch	Hand	Finish
3L	7=7 Pin Only	R=Rim	D=Dead-locking	2=Vertical	625=Bright Chromium plated 626= Satin Chromium Plated

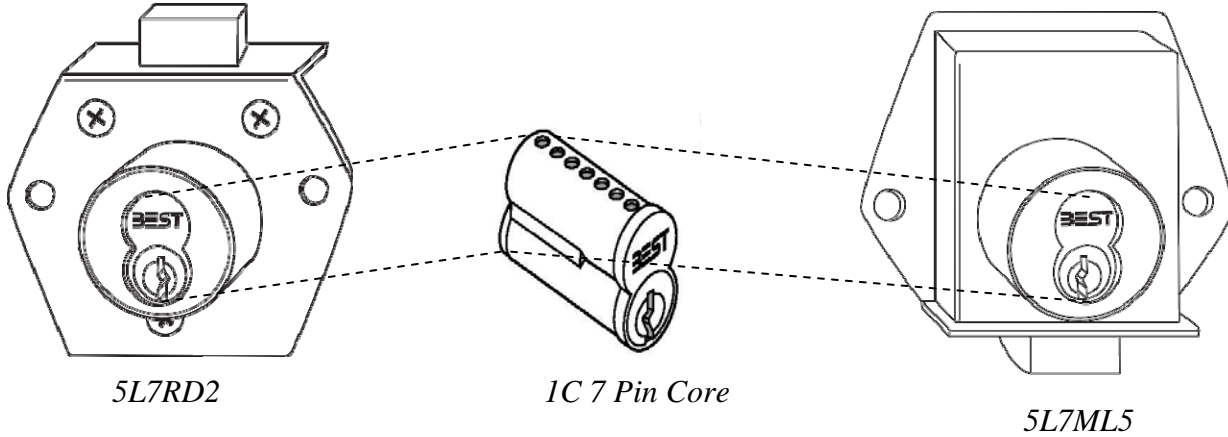


**Screw For wood or metal doors**  
Mounting screws (4) #8 X 1" RH sheet metal screws

Title				BEST ACCESS SYSTEMS			
Installation Specifications for 3L7RD Cabinet Lock				Rev date	Template number	Rev	
Series	Backset	Trim style	Door thickness	09/1999	L08	A	
3L	7/8"	—	1 3/16" max				

T56110/Rev A 1805727 ER-7991-1 Sept 1999

**5L Series**



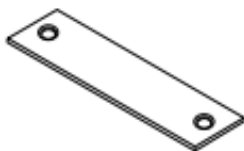
- 5L7RD2- Cash wrap storage drawers; showcases: Jewelry stock drawers, back Island product boxes, Jewelry line- safe doors, stock drawers, office storage credenzas (hinged doors). Must specify “T” option for captive key function in the Deadbolt Type.
- 5L7ML5- Jewelry Showcase ‘lift-up’ doors. Latch bolt Type. Does not have ‘captive key’ function
- Both Deadbolt and Dead latch require an I/C 7 pin core
- Refer to dimensional drawings L14B; L09A on page 9 of this document

**How to order**

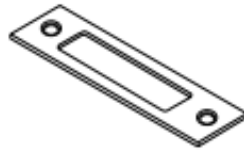
Series	Core	Mounting	Latch	Hand	Finish	Options
5L	7=7 Pin	R=Rim M=Mortise housing	D=Dead-locking L=Latchbolt	2=Vertical 5=Inverted	625=Bright Chromium plated 626= Satin Chromium Plated	T=Captive key (Key Retaining)

**5L Strike Options**

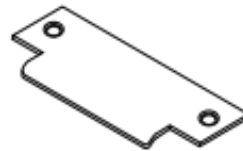
Strike plate specification:  $\frac{3}{8}$ " x  $\frac{1}{16}$ " x  $1 \frac{7}{8}$ "; hole spacing  $1 \frac{7}{16}$ "



A-450



A-451

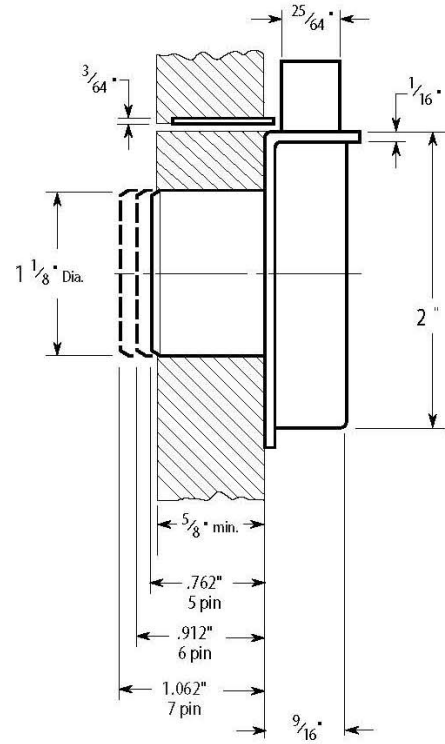
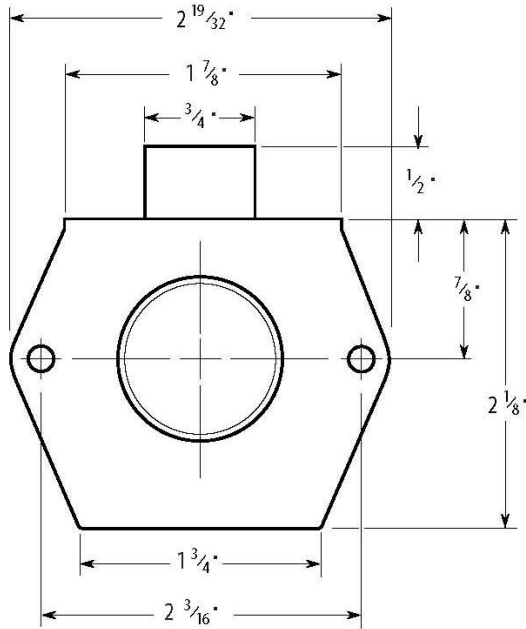
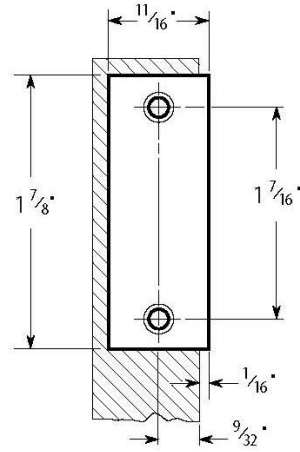
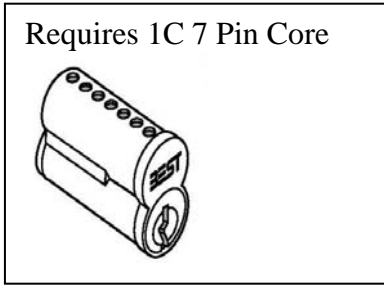


A-452



A-453

### 5L7RD Dimensional Drawing

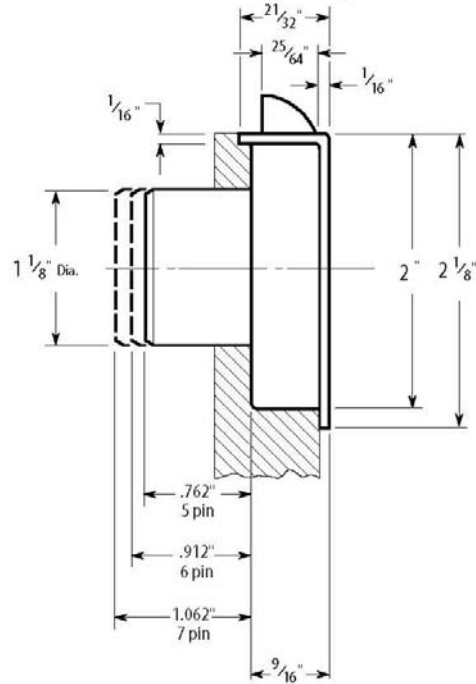
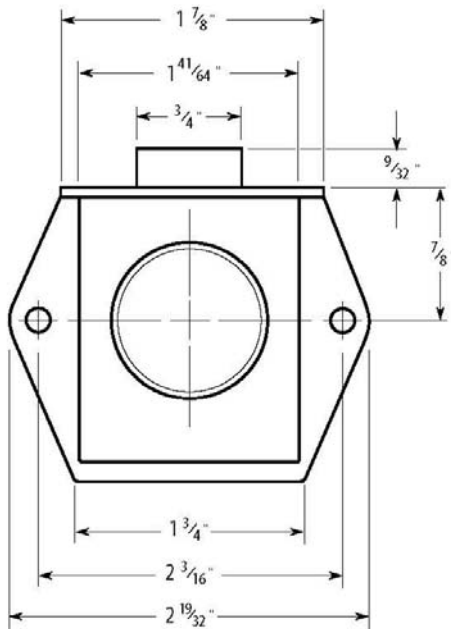
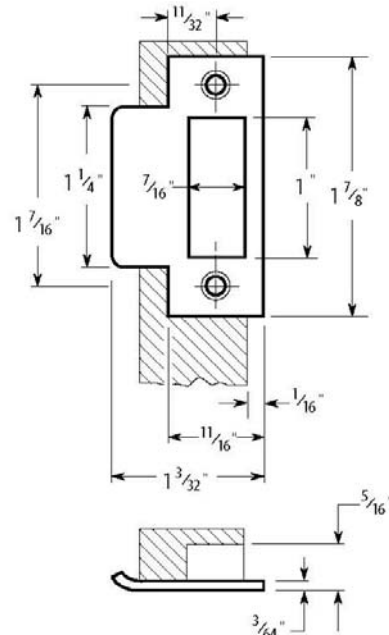
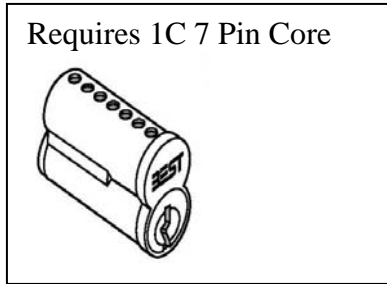


Screw	For wood or metal doors
Mounting screws (2)	#8 X 5/8" RH sheet metal screws
Strike screws (2)	#5 X 5/8" RH sheet metal screws

Title Installation Specifications for 5L7RD Cabinet Lock				<b>BEST ACCESS SYSTEMS</b>		
Series 5L	Backset 7/8"	Trim style —	Door thickness 5/8"–1"	Rev date 09/1999	Template number <b>L14</b>	Rev <b>B</b>

T56115/Rev B 1805884 ER-7991-1 Sept 1999

**5L7ML Dimensional Drawing**

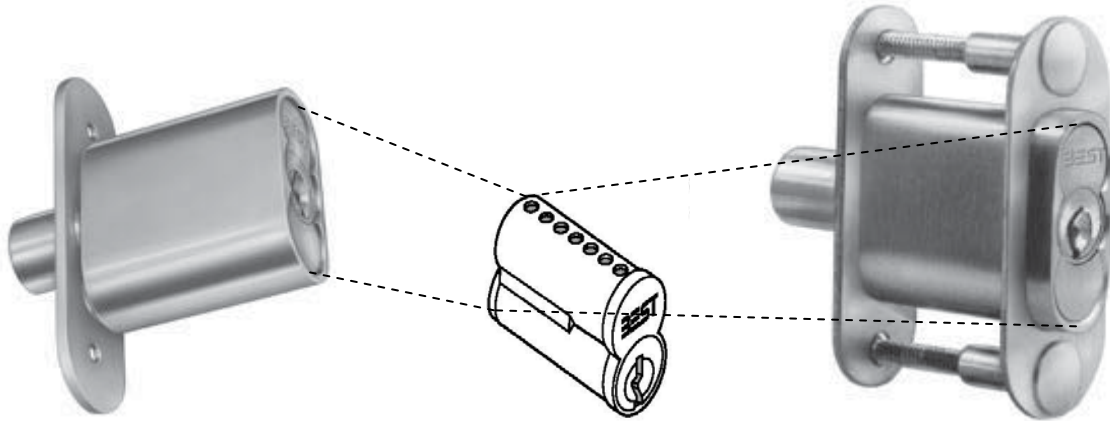


Screw	For wood or metal doors
Mounting screws (2)	#8 X 5/8" RH sheet metal screws
Strike screws (2)	#5 X 5/8" FH sheet metal screws

Title Installation Specifications for 5L7ML Cabinet Lock				<b>BEST ACCESS SYSTEMS</b>			
Series 5L	Backset 7/8"	Trim style —	Door thickness 21/32"–1 1/2"	Rev date 09/1999	Template number <b>L09</b>	Rev <b>A</b>	

T56112/Rev A 1805769 ER-7991-1 Sept 1999

**2S Series**



*2S73 Surface Mounted*

*1C 7 Pin Core*

*2S74 x TBM Through-Bolt Mounted*

- Requires an 1C 7 pin core
- Refer to dimensional drawing S06A and S08C
- Applications: Office Door Credenzas, Wood sliding doors, Wood show case cabinets, Wood sliding doors

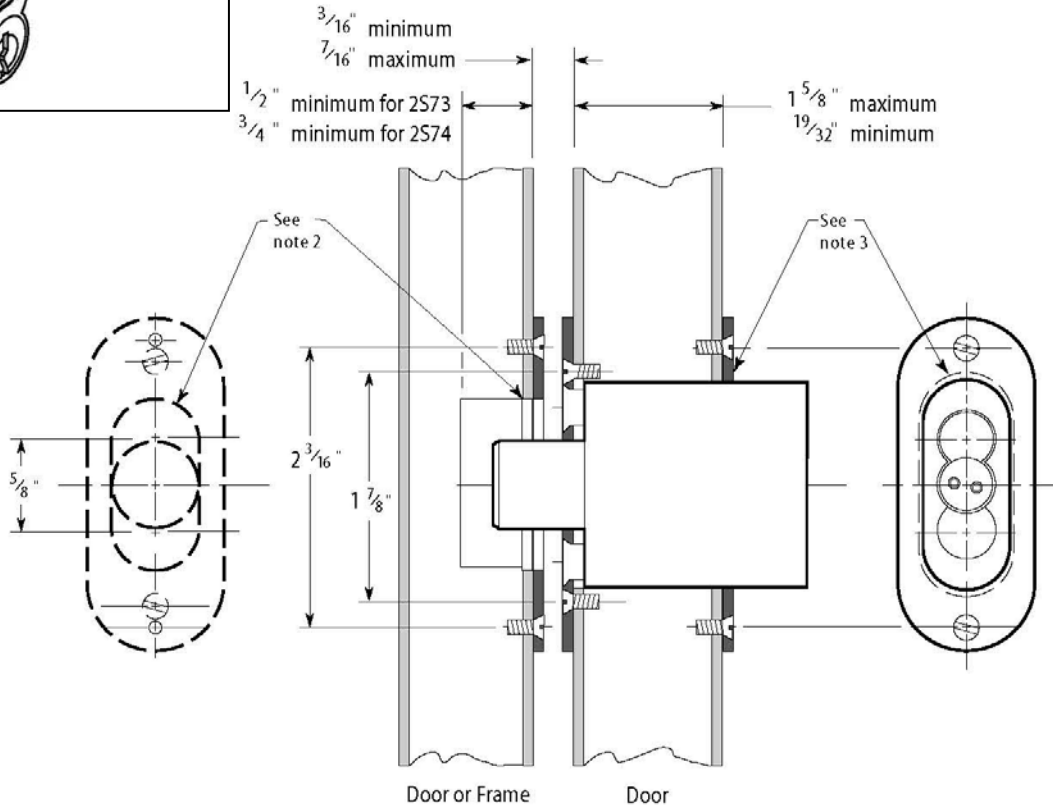
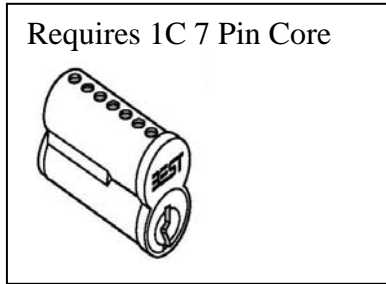
**How to order 2S73 & 2S74**

<b>2S</b>	<b>7</b>	<b>3</b>	<b>626</b>
<b>Series</b>	<b>Core Housing</b>	<b>Function</b>	<b>Standard Finish</b>
2S-Pushlock for Sliding door accepts all BEST cores	7-7pin housing	See below	626-Satin Chrome 625-Bright Chrome

**Function Chart**

<b>Function Code</b>	<b>Door</b>	<b>Bolt Thickness</b>	<b>Operation</b>
3	7/8" dia. To 1 5/8"	19/32" dia. 1/2" throw	•When unlocked, case of lock moves out through door stile and may be used as a handle for moving door. •To lock 2S73 & 2S74, push case through door.
3 x TBM	7/8" to 1 5/8"	19/32" dia. 1/2" throw	
4 x TBM	7/8" dia. To 1 5/8"	19/32" dia. 3/4" throw	

## 2S73 & 2S74 Dimensional Drawing (non-TBN Push lock)



### Notes

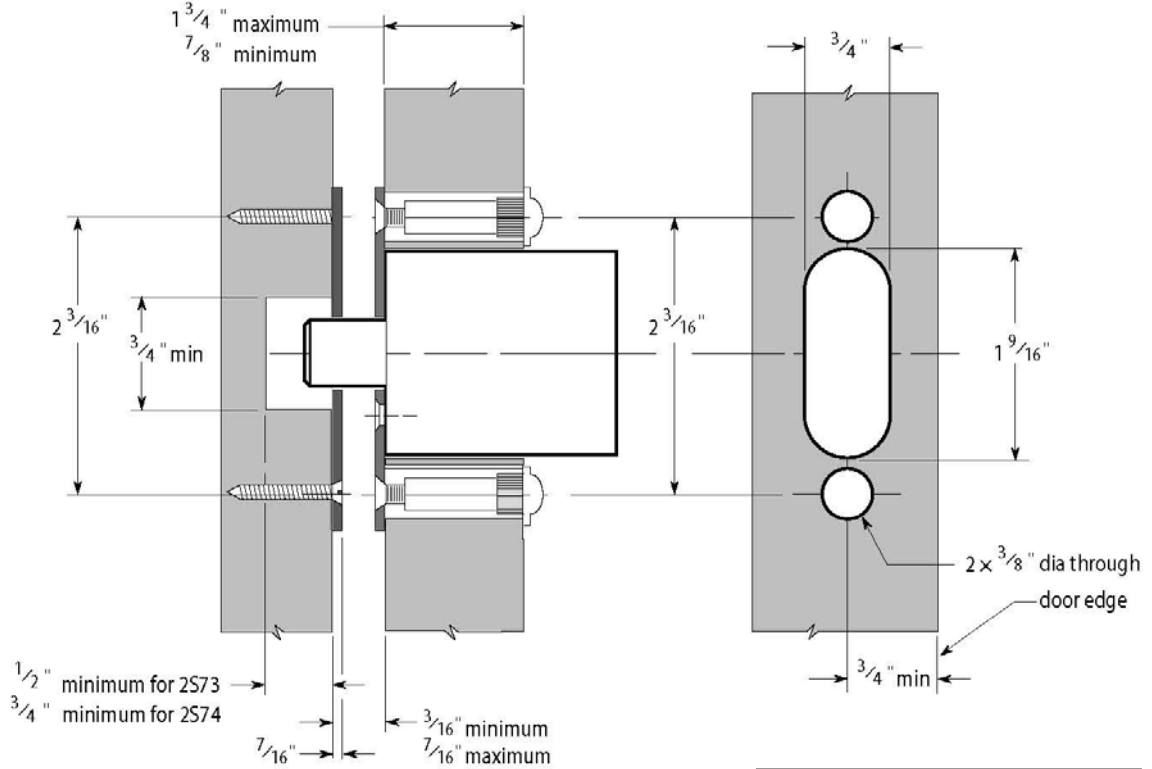
- 1 Attach the strike with #6 × 3/4" FHWS on wood doors.  
Use #6-32 × 1/4" FHMS on metal doors.
- 2 Oval slot for keeper plate and bolt is 21/32" × 1 9/32".
- 3 Slot through door is 3/4" × 1 9/16".
- 4 2S73: 1/2" bolt throw  
2S74: 3/4" bolt throw
- 5 Allow +1/32" tolerance for clearance.

Title Installation Specifications for 2S73 & 2S74 (non-TBM) Push Lock				<b>BEST ACCESS SYSTEMS</b>			
Series 2S	Backset —	Trim style —	Door thickness 1 9/32" - 1 5/8"	Rev date 04/2000	Template number <b>S06</b>	Rev <b>A</b>	

161989/Rev A 1816959 ER-7991-1 Apr 2000



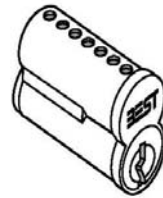
**2S73 & 2S74**  
**Dimensional Drawing**  
**(TBN Push lock)**



**Notes**

- 1 Attach the strike with #6  $\times$   $\frac{3}{4}$ " FHWS on wood doors.  
Use #6-32  $\times$   $\frac{1}{4}$ " FHMS on metal doors.
- 2 Oval slot for keeper plate and bolt is  $2\frac{1}{32}$ "  $\times$   $1\frac{9}{32}$ ".
- 3 Slot through door is  $\frac{3}{4}$ "  $\times$   $1\frac{9}{16}$ ".
- 4 2S73:  $\frac{1}{2}$ " bolt throw  
2S74:  $\frac{3}{4}$ " bolt throw
- 5 Allow  $+\frac{1}{32}$ " tolerance for clearance.

Requires 1C 7 Pin Core

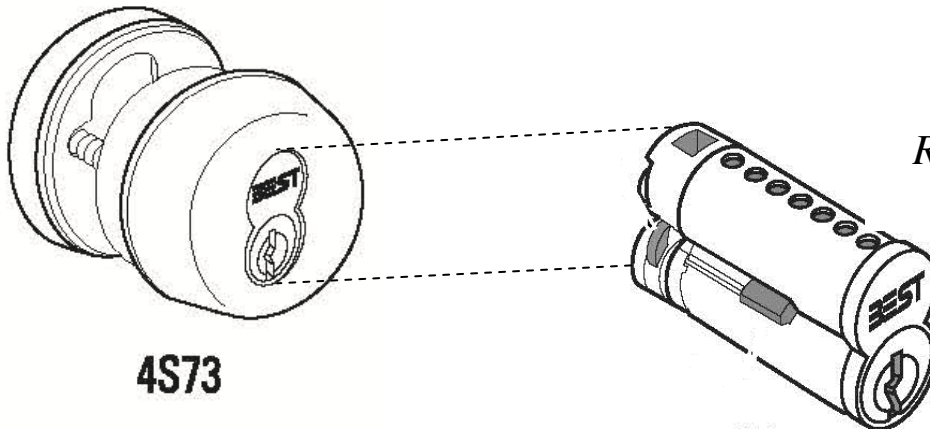


Title Installation Specifications for 2S73 $\times$ TBM & 2S74 $\times$ TBM Push Lock				<b>BEST ACCESS SYSTEMS</b>			
Series 2S	Backset —	Trim style —	Door thickness $\frac{7}{8}$ " - $1\frac{5}{8}$ "	Rev date 04/2000	Template number <b>S08</b>	Rev <b>C</b>	

T61991/Rev C 1817030 ER-7991-1 Apr 2000



**4S Series**

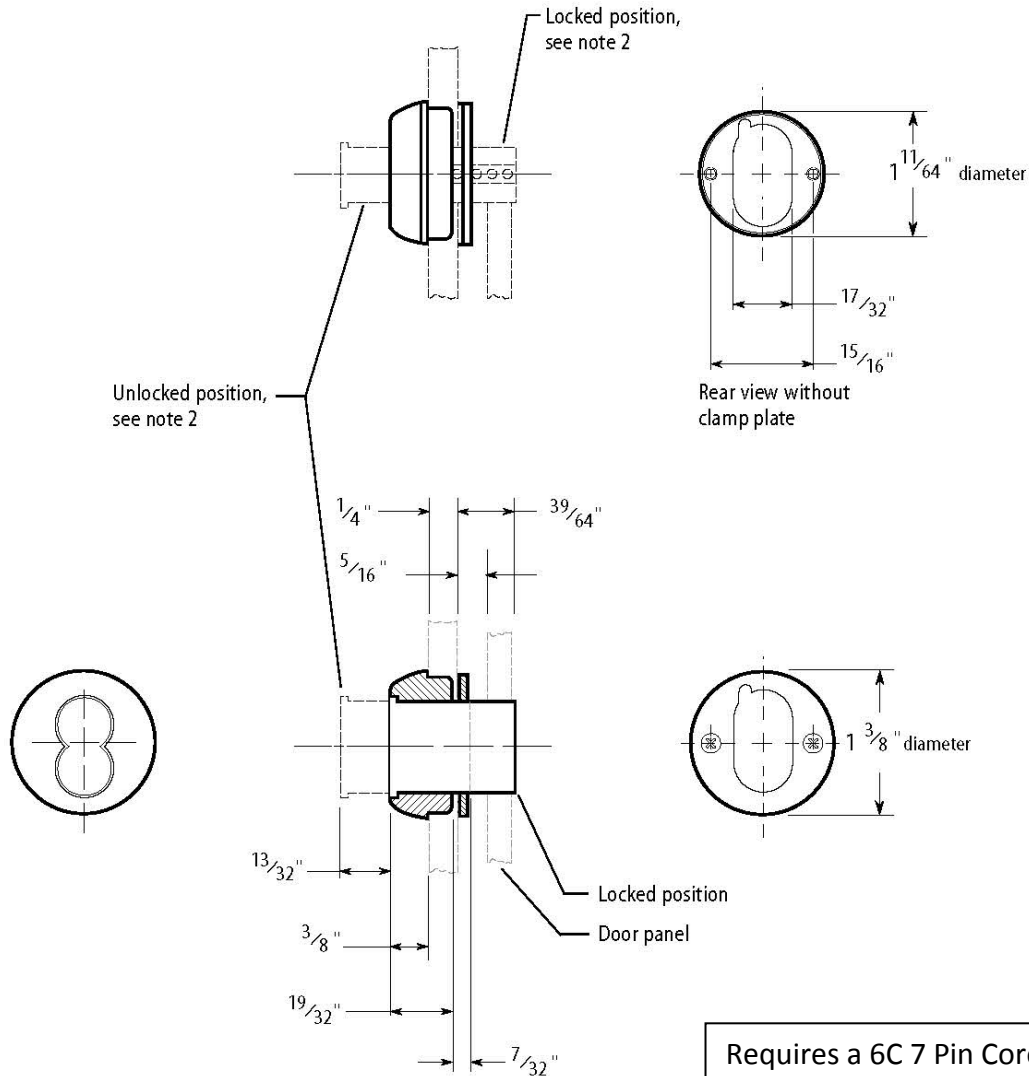


- Requires an 6C, 7 pin core
- Non Key Retaining
- Refer to dimensional drawing S01E
- Applications: Showcase with Sliding doors-glass and hardboard

**How to order 4S**

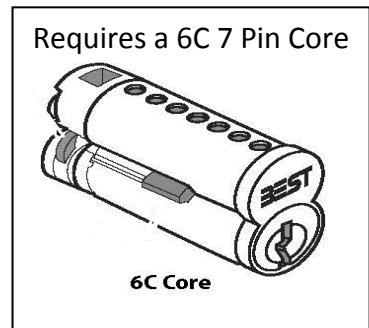
4S	7	3	626
Series	Core Housing	Function	Standard Finish
4S	7=7pin housing	3=Standard	625-Bright Chrome 626-Satin Chrome (standard finish)

### 4S73 Sliding Glass Door Cylinder



**Note**

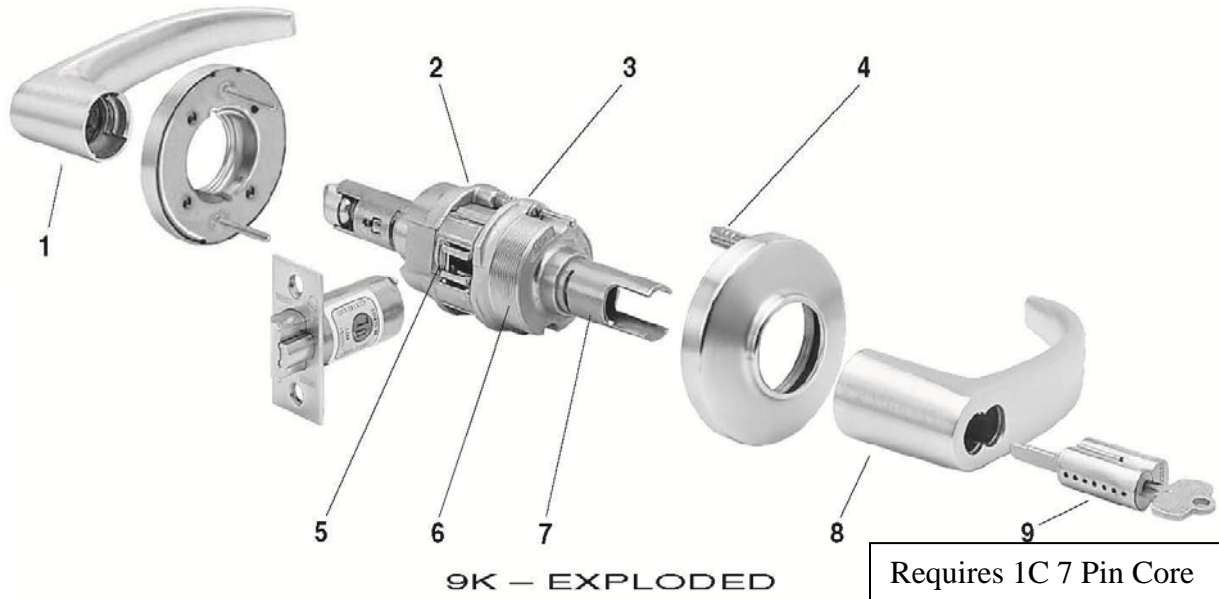
1 Use type 1C-Fed KRL core or 6C core for standard operation with key removable in either the locked or the unlocked position. Use type 1C-Fed KRT or 6CT core for standard operation with key removable only in the locked position. See T61980 *Installation Instructions for 1C-FED Cores used in 4S Sliding Glass Door Locks*, or T61981 *Installation Instructions for 6C Cores used in 4S Sliding Glass Door Locks*.



Title Installation Specifications for 4S73 Sliding Glass Door Cylinder				<b>BEST ACCESS SYSTEMS</b>		
Series 4S	Backset —	Trim style —	Door thickness —	Rev date 04/2000	Template number <b>S01</b>	Rev <b>E</b>

T61982/Rev E 1816875 ER-7991-1 Apr 2000

**9K Lockset**



**How to Order**

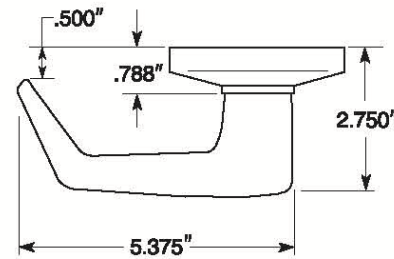
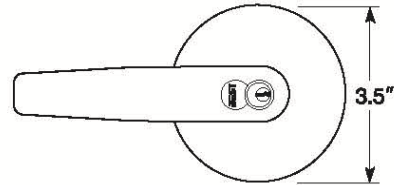
9K	3	7	AB	15	D	S3	626
Series	Backset	Core Housing	Function Code	Lever Style	Rose Style	Strike Package	Available Finishes
9K	3= 2 3/4"	7=7 Pin housing accepts all Best cores	AB= Entrance	15=Contour angle return	D=3 1/2" convex	S3=4 7/8" ANSI	625-Bright Chromium Plated 626-Satin Chrome

**Function**

Function & Diag. (ANSI No.)	Description	Outside Lever		Inside Lever	
		Latched by	Locked by	Unlocked by	Locked by
<b>Single Keyed</b>					
<b>Entrance</b> <b>AB</b>  F109	<ul style="list-style-type: none"> <li>Rotating the inside lever,</li> <li>Rotating the outside lever—only when the inside push button is out,</li> <li>Turning the key in the outside lever</li> </ul>	<ul style="list-style-type: none"> <li>Pushing the inside button,</li> <li>Pushing and turning the inside button. Turning the button keeps the outside lever locked until the button is turned back</li> </ul>	<ul style="list-style-type: none"> <li>Turning the key in the outside lever, (only when the button is not turned)</li> <li>Rotating the inside lever, (only when the button is not turned).</li> <li>Closing the door (only when the button is not turned)</li> </ul>	Cannot be locked	Always unlocked

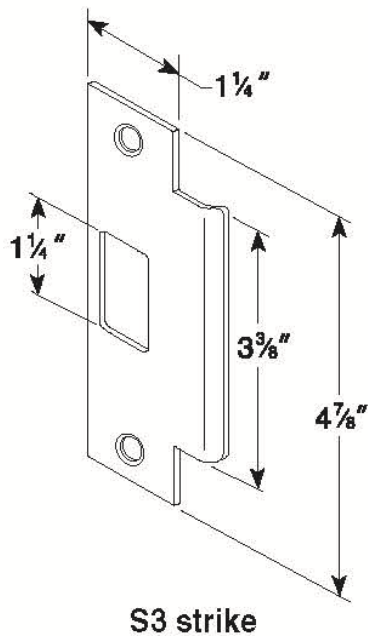
**9K Lockset**

**Lever and Trim Dimensions**



**#15D or #15L Trim  
("D" rose shown)**

**Strike**



**8KS3**

**8KS3 Strike**

**Dimension:** Conforms to ANSI A115.2 for 1 3/4" doors (4 7/8" x 1 1/8" with curved lip).

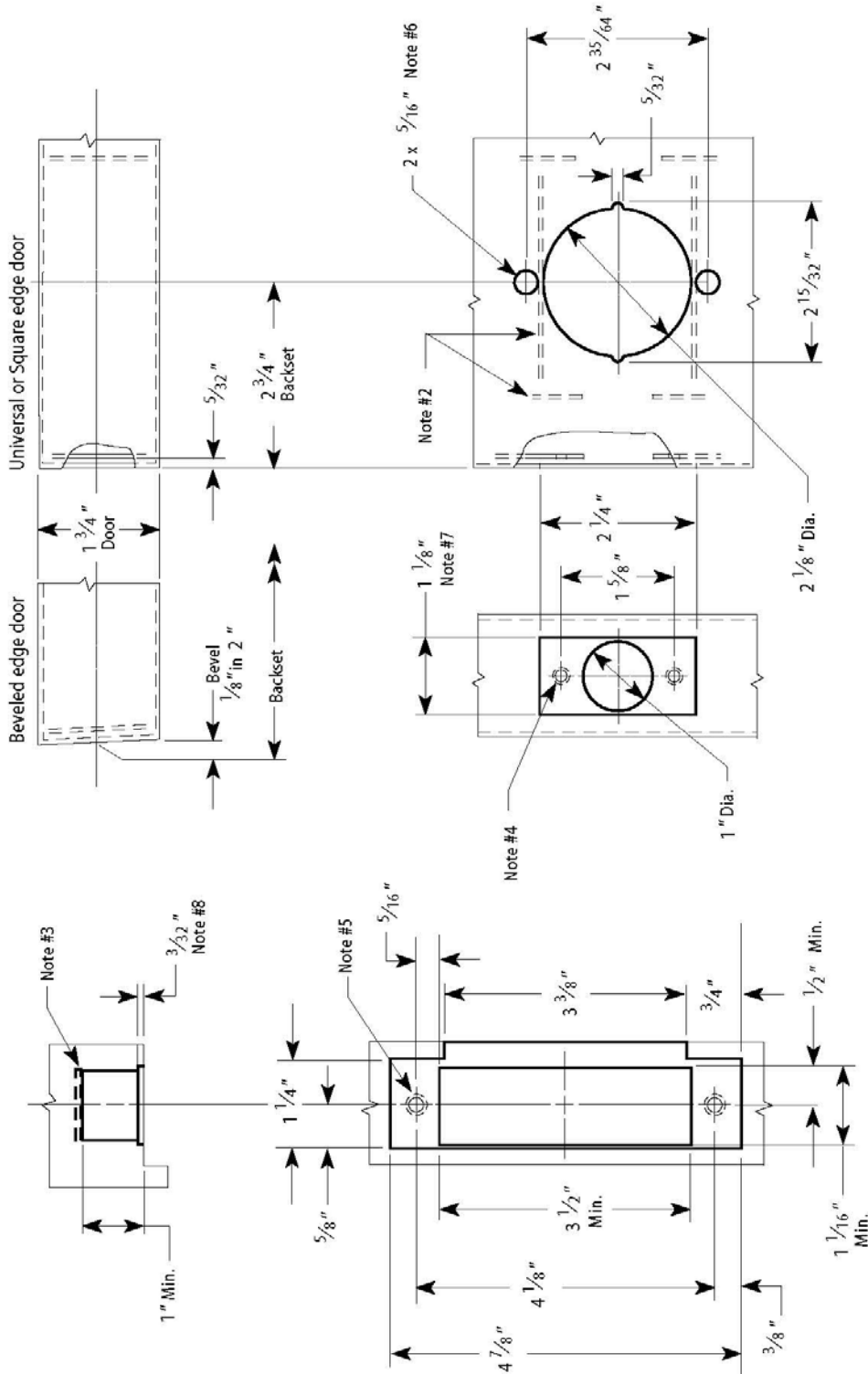
**To order:** (with unit) designate "S3" on How to Order (page 3).

**To order:** (without unit) designate 8KS3 and finish.

### 9K Lockset

**Notes**

- 1 Allow plus tolerance for clearance per ANSI A115.2.
- 2 Lock and latch case support by door manufacturer.
- 3 Plaster guard by door manufacturer
- 4 Prepare for a #8-32 screw.
- 5 Prepare for a #12-24 screw.
- 6 For 73KC and 93K only! The 63K and 83K "C" style trim will **not** cover these holes.
- 7 For 63K and 73KC only, a 1" latch face is available.
- 8 When a strike box is used, 9/64".
- 9 For 73KC locks, use the KD303 drill jig to ensure that through-bolts and levers are properly aligned.



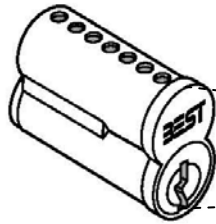
2 3/4" Backset Door Preparation

Frame Preparation

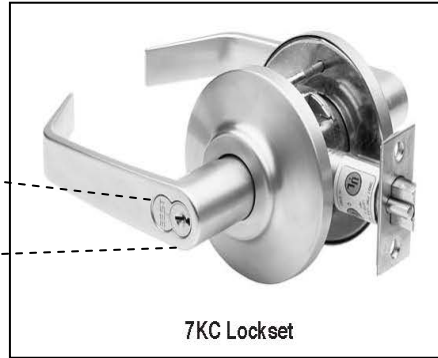
Title Door & Frame Preparation for 63K, 73KC, 83K, & 93K Cylindrical Locks				<b>BEST ACCESS SYSTEMS</b>			
Series 63K, 73KC, 83K, 93K	Backset 2 3/4"	Strike Large ANSI strike (S3)	Door thickness 1 3/4"	Rev date 11/2002	Template number <b>K09</b>	Rev <b>G</b>	

T56053/Rev G 1797821 ER-7991-1 Nov 2002

**7KC Lockset**



1C 7 Pin Core

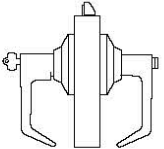


7KC Lockset

**How to order**

7KC	3	7	AB	15	D	S3	626
Series	Backset	Core Housing	Function Code	Lever Style	Trim Style	Strike Package	Available Finishes
7KC	73KC= 2 3/4"	7=7 Pin housing accepts all Best cores	AB= Entrance	15=Contour angle return	D=3 1/2"	S3= ANSI	625-Bright Chromium Plated 626-Satin Chrome

**Function**

Function & Diag. ANSI No. Grade	Description Latch operated by	Outside Lever		Inside Lever	
		Locked by	Unlocked by	Locked by	Unlocked by
<b>Single Keyed</b>					
<b>AB-Entry</b>  F109-Grade 2	<ul style="list-style-type: none"> <li>Rotating inside lever, <b>QR</b></li> <li>Rotating outside lever—only when inside push button is out, <b>QR</b></li> <li>Turning key in outside lever.</li> </ul>	<ul style="list-style-type: none"> <li>Pushing inside button, <b>QR</b></li> <li>Pushing and turning the inside button. Turning the button keeps the outside lever locked until the button is turned back.</li> </ul>	<ul style="list-style-type: none"> <li>Turning the key in the outside lever, (only when the button is not turned) <b>QR</b></li> <li>Rotating the inside lever (only when the button is not turned) <b>QR</b></li> <li>Closing the door (only when the button is not turned).</li> </ul>	Cannot be locked	Always unlocked



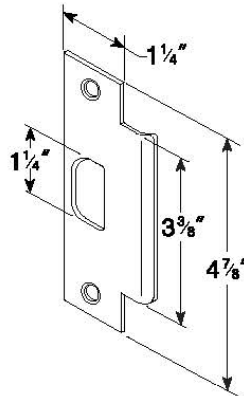
6KS3

**6KS3 Strike (ANSI Strike)**

Dimension: Conforms to ANSI A115.2 for 1 3/4" doors (4 7/8" x 1 1/8" with curved lip)

To order: (with unit) designate "S3" (page 7)

To order: (without unit) designate 6KS3 and finish



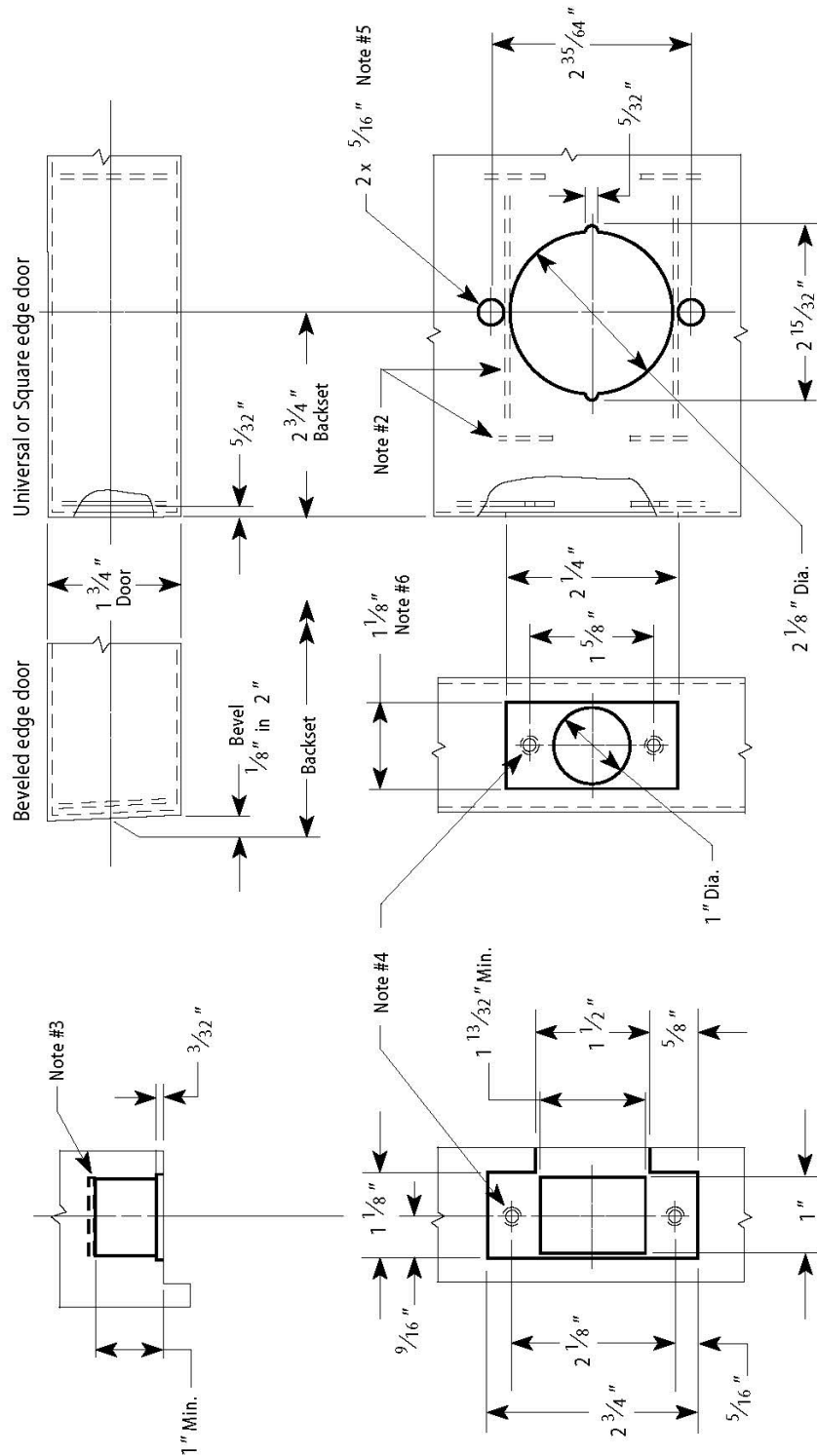
S3 strike



### 7KC Lockset

**Notes**

- 1 Allow plus tolerance for clearance per ANSI A115.2.
- 2 Lock and latch case support by door manufacturer.
- 3 Plaster guard by door manufacturer.
- 4 Prepare for a #8-32 screw.
- 5 For 73KC and 93K only! The 63K and 83K "C" style roses will **not** cover these holes.
- 6 For 63K and 73KC only, a 1" latch face is available.
- 7 For 73KC locks, use the KD303 drill jig to ensure that through-bolts and levers are properly aligned.



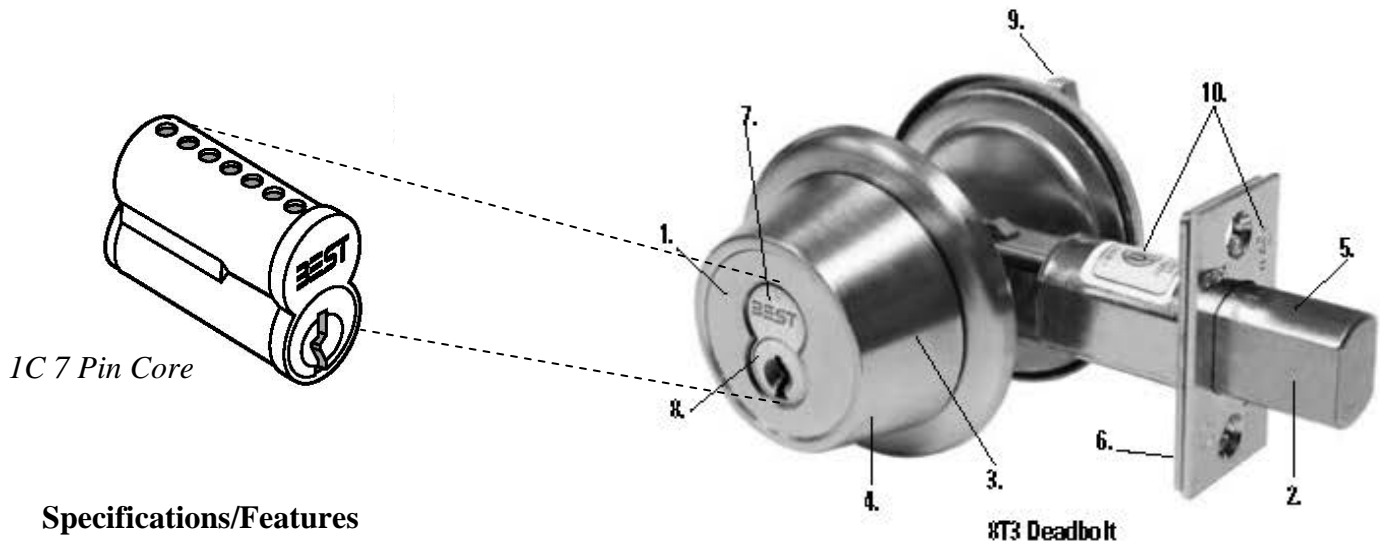
2 3/4" Backset Door Preparation

Frame Preparation

Title Door & Frame Preparation for 63K, 73KC, 83K, & 93K Cylindrical Locks				<b>BEST ACCESS SYSTEMS</b>		
Series 63K, 73KC, 83K, 93K	Backset 2 3/4"	Strike Small ANSI strike (STK)	Door thickness 1 3/4"	Rev date 11/2002	Template number <b>K08</b>	Rev <b>G</b>

T56052/Rev G 1797780 ER-7991-1 Nov 2002

### 73T & 83T Tubular Deadbolts



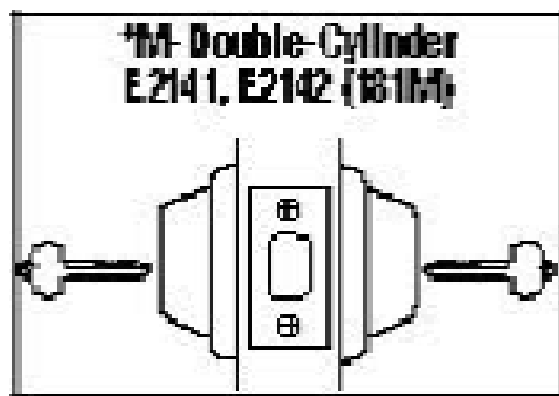
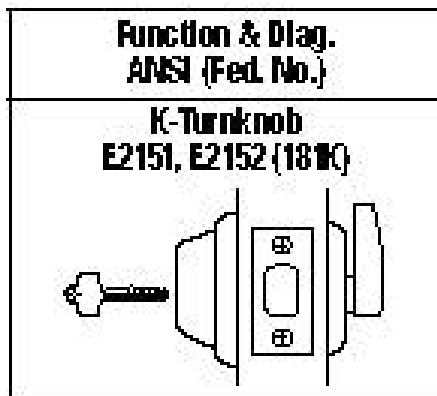
#### Specifications/Features

1. No exposed mounting screws
2. Full 1" stainless steel throw deadbolt
3. Free-turning, wrench resistant tapered cylinder ring
4. 8T3Solid extruded brass or bronze cylinder, Grade 1  
7T3 solid cast zinc with brass or bronze shell, Grade 2
5. Stainless steel for strength and corrosion resistance
6. Simple installation; self-aligning and reversible strike
7. May be keyed into existing BEST master keyed system
8. The original interchangeable core permits instant and economical rekeying
9. ADA turn lever
10. Deadbolt UL listed for use as auxiliary lock type on 3 hr fire doors. Also carry the C-UOL mark which is accepted in Canada.

#### How to order

83T	7	K	STK	626
<b>Backset</b>	<b>Core Housing</b>	<b>Function Code</b>	<b>Strike Package</b>	<b>Available Finishes</b>
73T= 2 3/4" 83T= 2 3/4"	7=7 Pin housing accepts all Best cores	K=Turnknob M=Double Cylinder	STK=Standard Deadbolt	625-Bright Chrome 626-Satin Chrome

#### Function

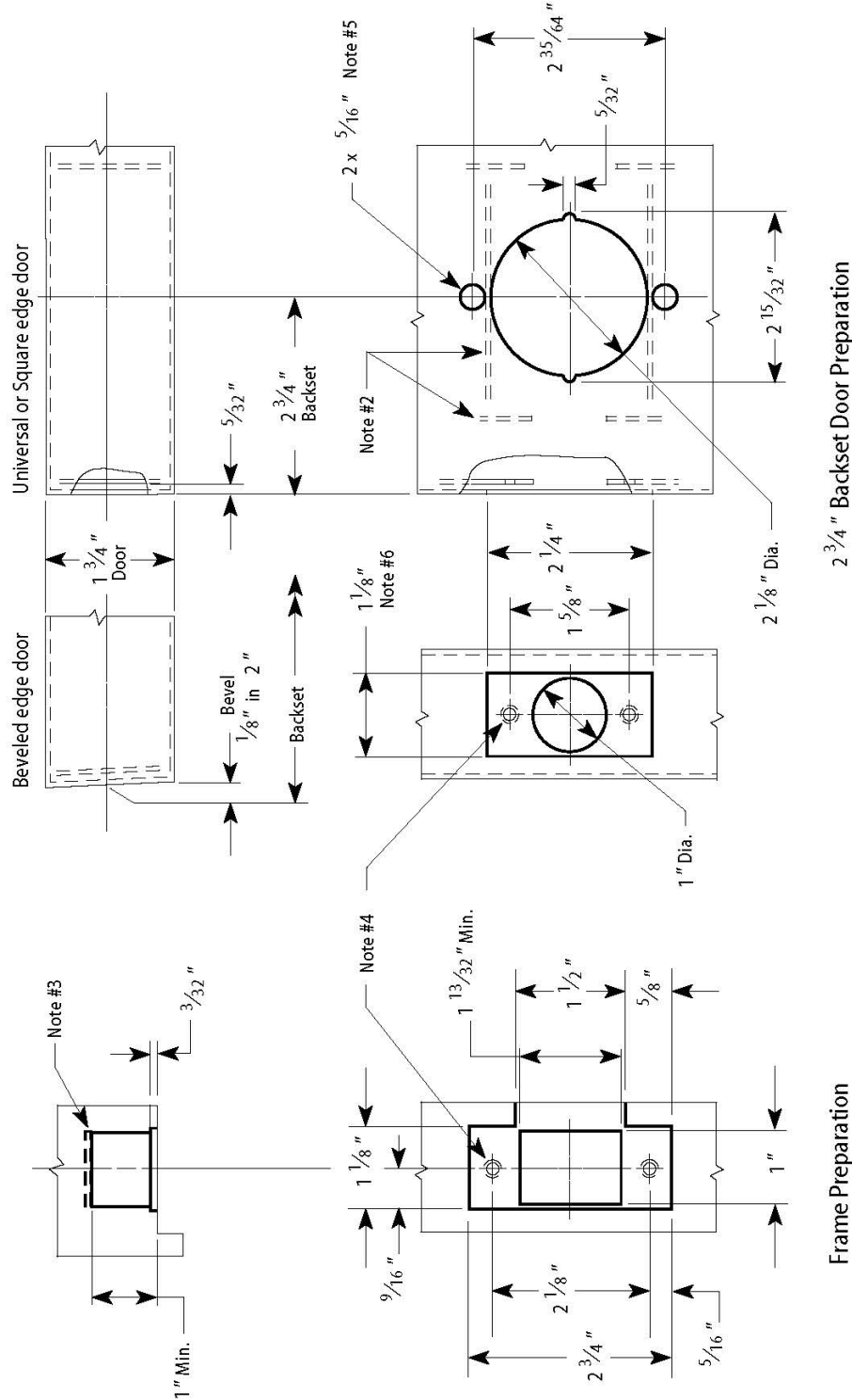




### 73T & 83T Tubular Deadbolt

**Notes**

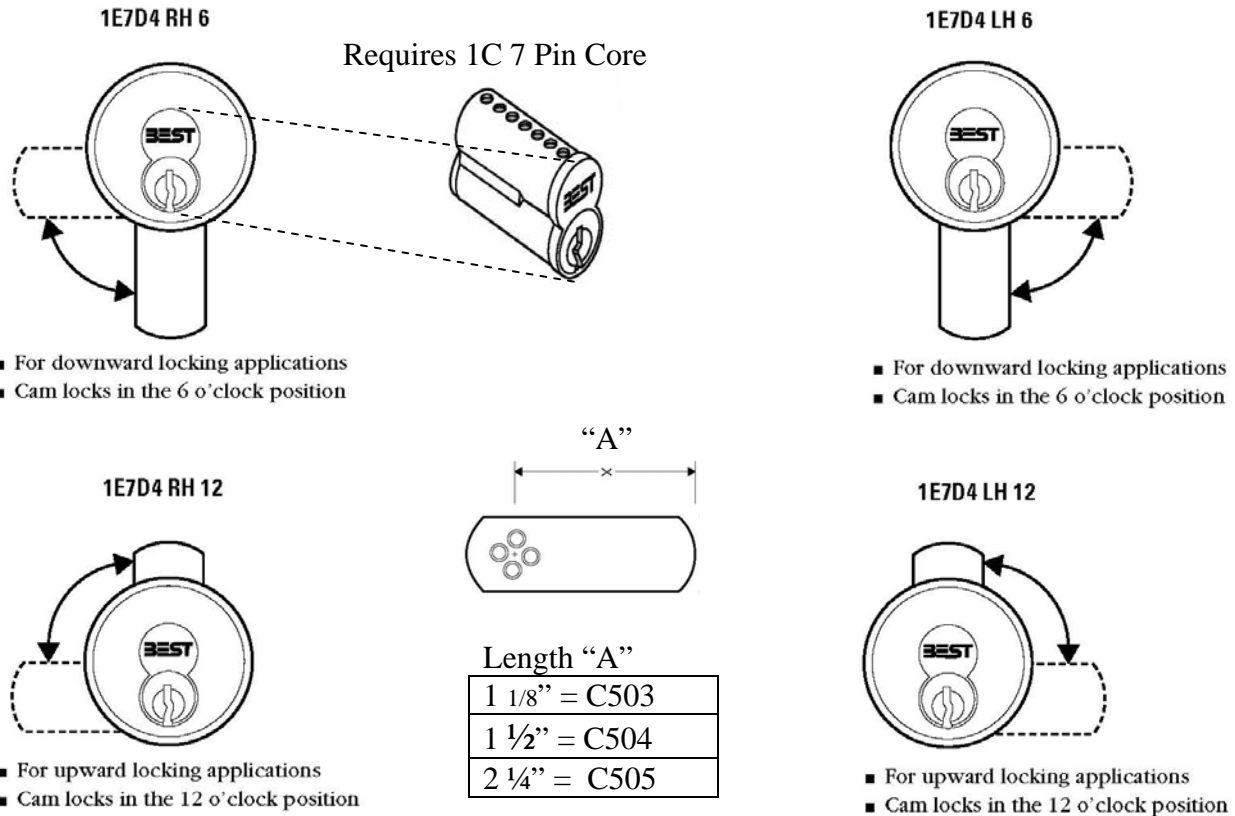
- 1 Allow plus tolerance for clearance per ANSI A115.2.
- 2 Lock and latch case support by door manufacturer.
- 3 Plaster guard by door manufacturer.
- 4 Prepare for a #8-32 screw.
- 5 For 73KC and 93K only! The 63K and 83K "C" style roses will **not** cover these holes.
- 6 For 63K and 73KC only, a 1" latch face is available.
- 7 For 73KC locks, use the KD303 drill jig to ensure that through-bolts and levers are properly aligned.



Title Door & Frame Preparation for 63K, 73KC, 83K, & 93K Cylindrical Locks				<b>BEST ACCESS SYSTEMS</b>		
Series 63K, 73KC, 83K, 93K	Backset 2 3/4"	Strike Small ANSI strike (STK)	Door thickness 1 3/4"			

T56052/Rev G 1797780 ER-7991-1 Nov 2002

## Slabbed Cabinet Mortise Cylinder Direct Motion- Key Retained



**How to Order Special Macy’s Cylinders:**

Series	Core	Mounting Housing	Latch Type	Hand Type	Finish	Handing	Options
IE	7	D4	C503	RP3-7Pin mortise	613	RH	6- 6 o'clock
			C504		625	LH	12- 12 o'clock
			C505		626		

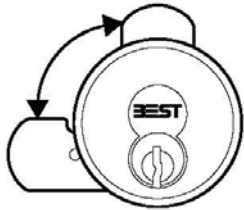
**How to order Standard Cylinders:**

Series	Core	Function	Cam	Ring	Finish	Handing
IE	7	D4	C503	RP3-7Pin mortise	613	RH
			C504		625	LH
			C505		626	

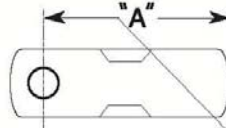
- Refer to dimensional drawing E02B and E03C

## Slabbed Cabinet Mortise Cylinder Lost Motion

1E7E4 RH 12 or 9



- For upward locking applications
- Cam locks in the 12 o'clock or 9 o'clock position



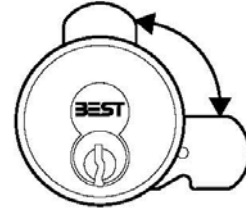
Length "A"

1 1/8" = C500

1 1/2" = C501

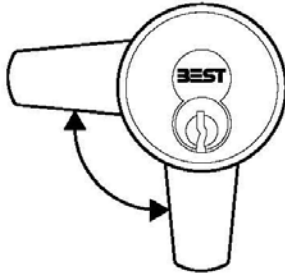
2 1/4" = C502

1E7E4 LH 12 or 3

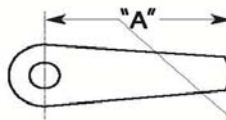


- For upward locking applications
- Cam locks in the 12 o'clock or 3 o'clock position

1E7E4 RH 6 or 9



- For downward locking applications
- Cam locks in the 6 o'clock or 9 o'clock position



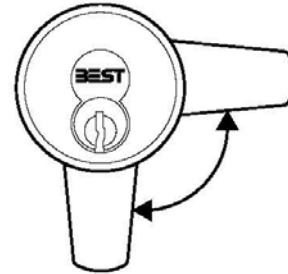
Length "A"

1 1/8" = C506

1 1/2" = C507

2 1/4" = C508

1E7E4 LH 3 or 6



- For downward locking applications
- Cam locks in the 3 o'clock or 6 o'clock position

- Refer to dimensional drawing E02B and E03C
- Requires a 1C 7 Pin Core

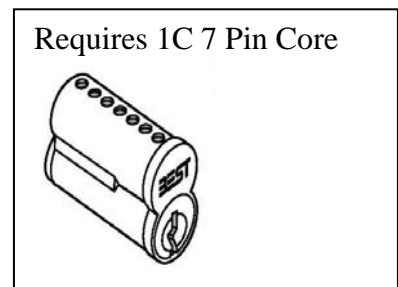
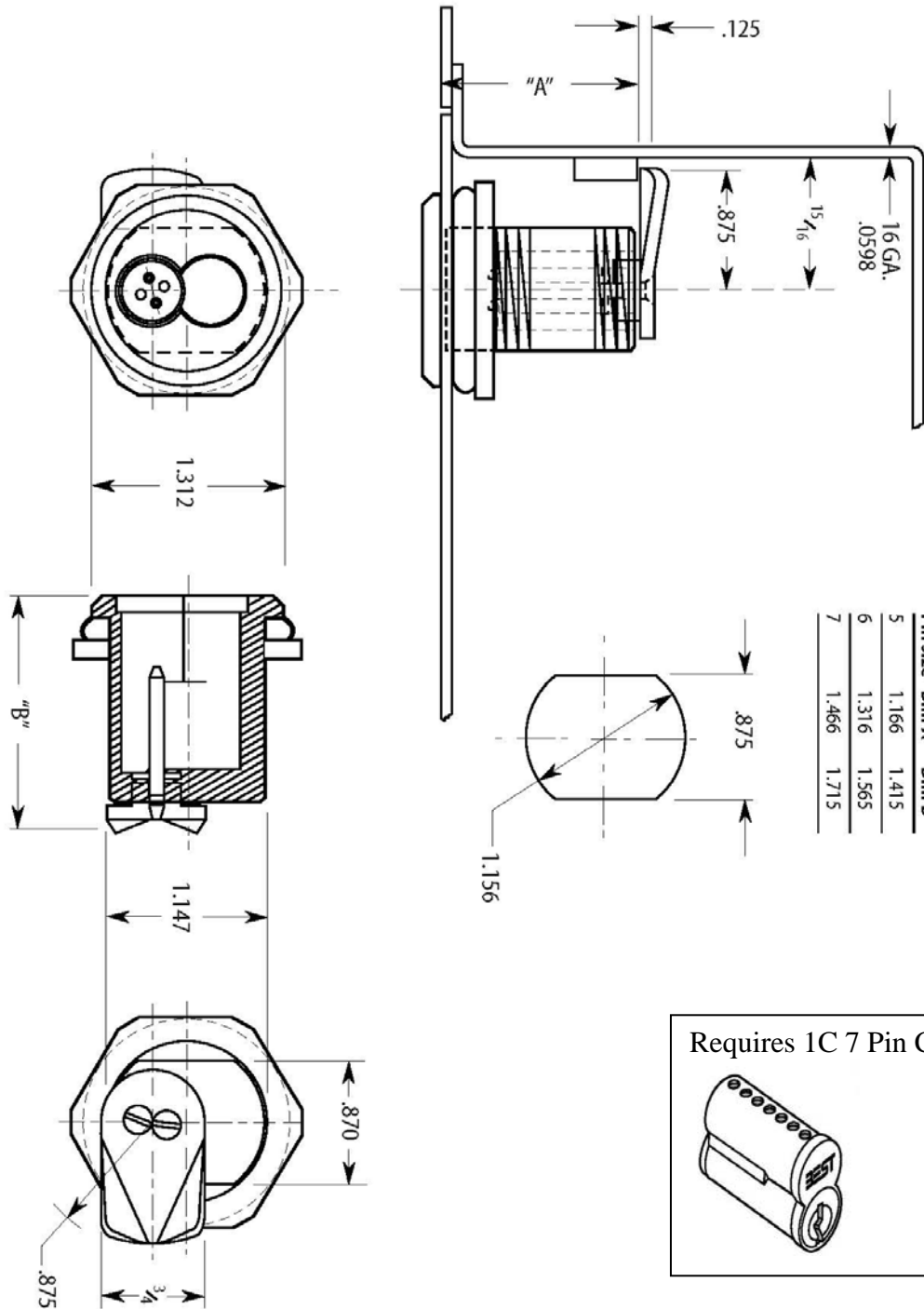
### How to Order Special Macy's Cylinders:

Series	Core	Function	Cam	Ring	Finish	Handing
1E	7	E4	C500	RP3-7Pin mortise	625	RH
			C501		626	LH
			C502			
			C506			
			C507			
			C508			

### How to order Standard Cylinders:

Series	Core	Function	Cam	Ring	Finish	Handing
1E	7	E4	C229	RP3-7Pin mortise	625 626	RH LH

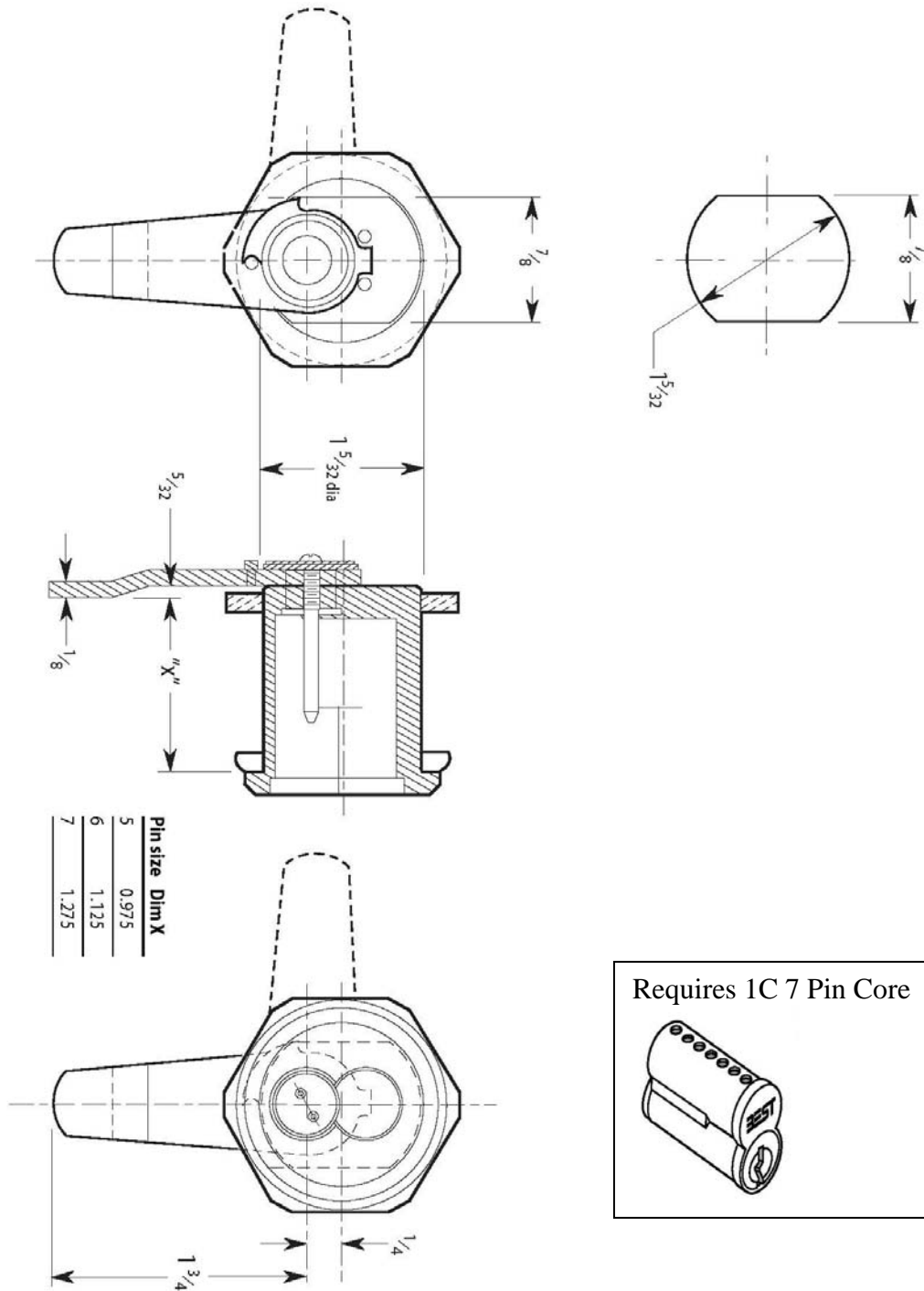
1E\_D4 Cylinder



Title Template for 1E_D4 Cylinders				<b>BEST ACCESS SYSTEMS</b>			
Series 1E_D4	Backset	Trim style	Door thickness	Rev date 04/1999	Template number <b>E02</b>	Rev <b>B</b>	

T61966/Rev B 1794930 ER-7991-1

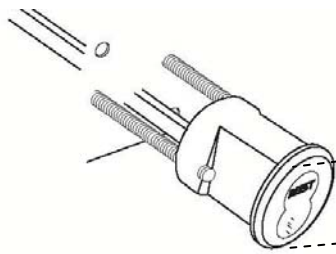
1E\_E4 Cylinder



Title Template for 1E_E4 Cylinders				<b>BEST ACCESS SYSTEMS</b>			
Series 1E_E4	Backset	Trim style	Door thickness	Rev date 11/2008	Template number <b>E03</b>	Rev <b>C</b>	

T61967/Rev C 1794972 ER-7991-1

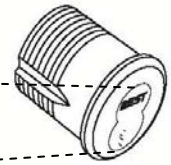
## Cylinders & Cams



1E72  
RIM Cylinder



Requires 1C 7 Pin Core



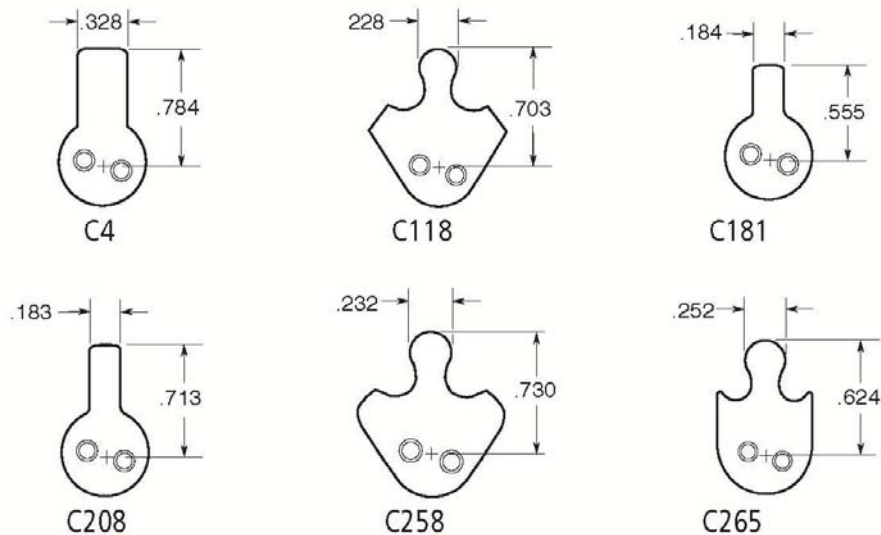
1E74  
Must specify cam  
Mortise Cylinder

- Refer to dimensional drawing E03C on page 17
- Requires a 1C 7 Pin Core
- Applications: 1E7--Exit Devices  
1E74--Mortise locks, store front glass doors
- Common Cams are listed below

### How to order E Series

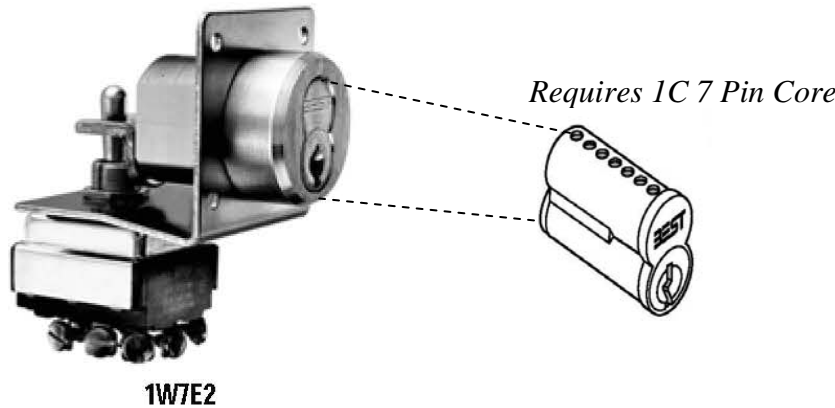
Series	Core	Function	Latch Type (Cam)	Ring	Finish
1E	7	2-rim 4-mortise	Refer to Cams listed below	RP3-7 Pin mortise	613- dark bronze 625—bright chromium plated 626—satin chromium plated

### Cams

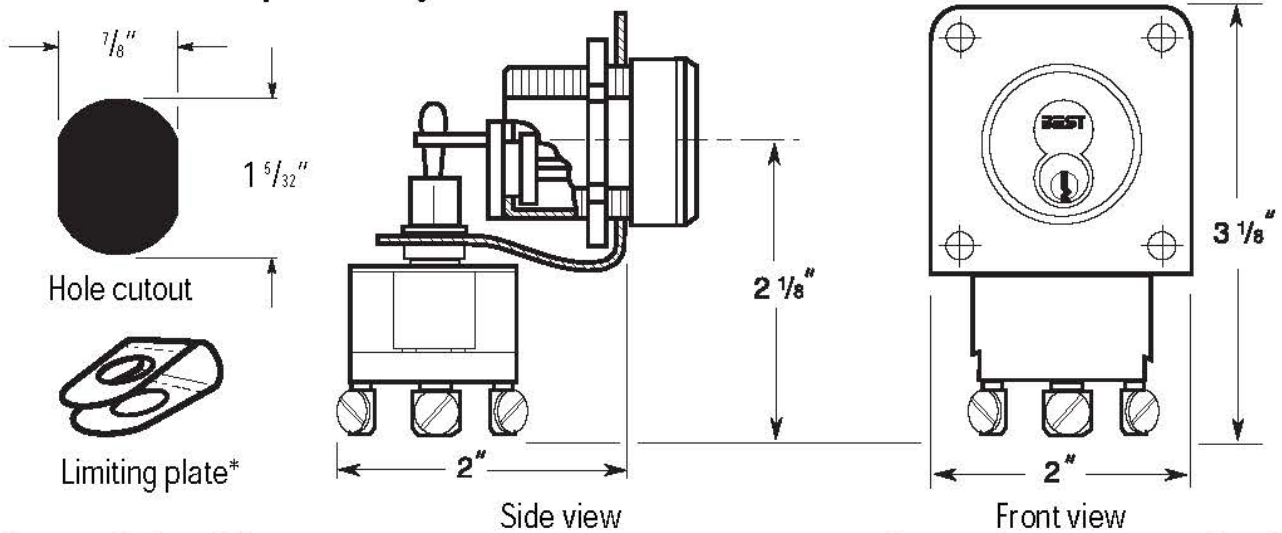




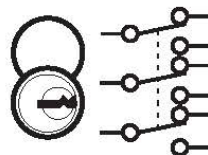
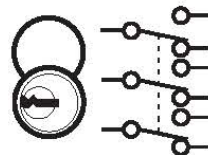
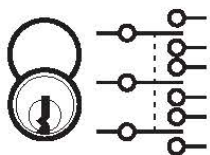
## Electric Switch Locks 1W7E2



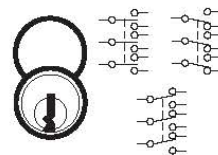
- Contact rating: 110VAC, 15 amp, resistance; 220VAC, 10amps, resistance
- Horsepower rating: 125-250 VAC or VDC, 3/4 HP; 1, 2, or 3 phase
- Operating temperature: 0 to +150 F(-18C to 66C)
- Switch type: TPDT (Triple pole-double throw)
- Switch lock action: Maintained Momentary (on-center off-on)
- Number of switches per assembly: One



### Key & switch positions



### Remove key

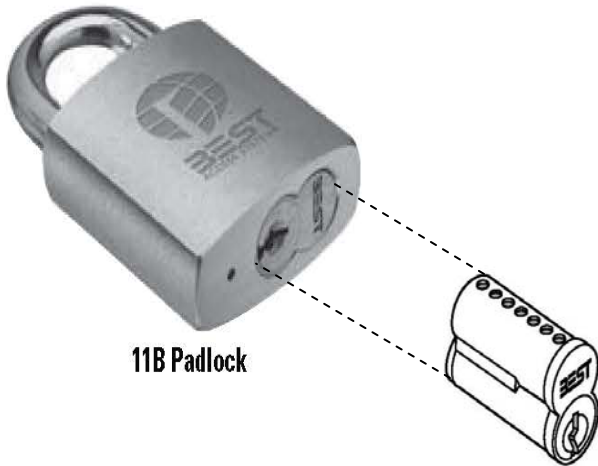


### Opt. box

SWR

\*Installing the limiting plate limits key removal to switch position 2, or 3. The key is always removed in the vertical position (key position 1).

**Padlocks  
11B Series**



**11B Padlock**

*Requires 1C 7 Pin Core*



**Specifications**

Case- Machined from solid extruded brass. Standard finish is 626 satin Chromium plated

Width – 1 5/8”

Length – 2 1/16”

Thickness - 25/32”

Shackle – The shackle locks at both heel and toe. The length of shackle opening is measured from top of case to inside of shackle when padlock is locked

Material – Brass or stainless steel

Diameter - 1/4”

Width of Opening – 7/8”

**Application:** Dock with overhead doors

**How to order**

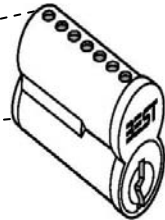
Series	Core Housing	Shackle Height	Function Code	Finish
11B- Brass 1/4” diameter	7- 7 Pin	Steel	T- key retained L-non key retained	626- Satin Chromium
		Brass		606=Satin Brass
		70=2”		



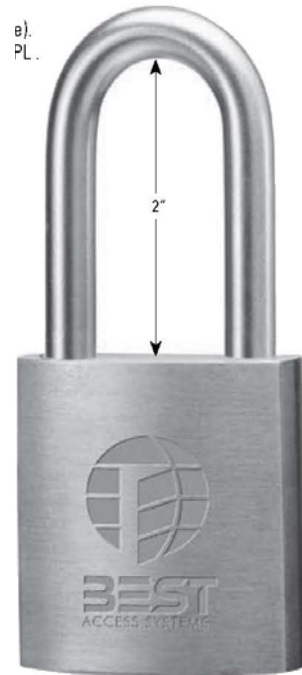
**Padlocks  
41B Series**



41B Padlock



Requires a 1C 7 Pin Core



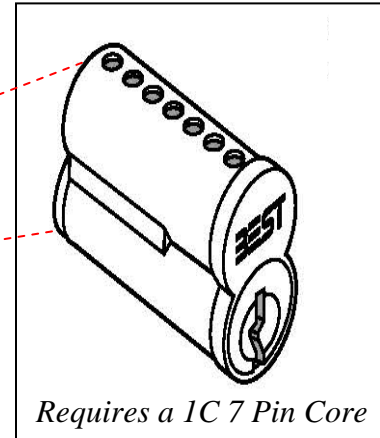
**Specifications**

- Case-Machined from solid extruded brass.
  - Finish-Standard is 626 satin chromium plated
  - Width-115/16"
  - Length-21/16"
  - Thickness-7/8"
- Shackle-The shackle locks at both heel and toe. The length of shackle opening is measured from top of case to inside of shackle when padlock is locked
  - Material-Stainless steel
  - Diameter-3/8"
  - Width opening- 7/8"
- Application- Robust applications like doors

**How to order**

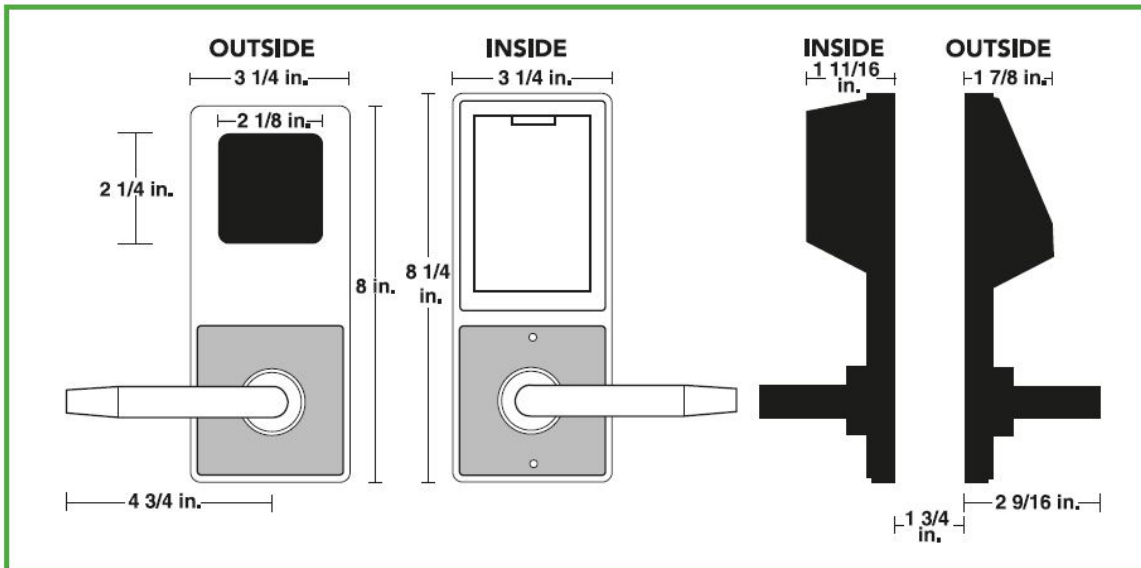
Series	Core Housing	Shackle Height	Function Code	Finish
41B- Brass 3/8" diameter	7- 7 Pin	Steel 72=2" Brass 70=2"	T- key retained L-non key retained	626- Satin Chromium 606= Satin Brass

**Alarm Lock Trilogy DL 2700**

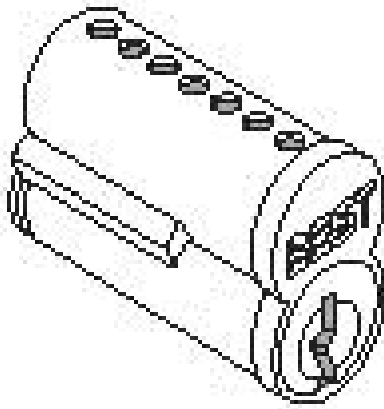


**How To order**

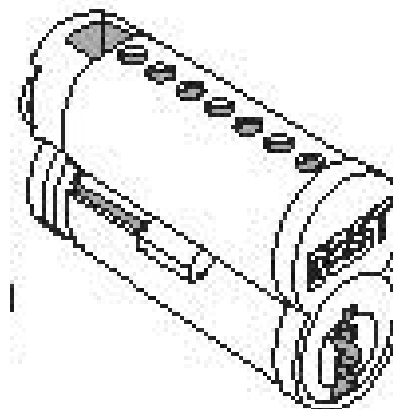
DL	27	00		IC	26D
Model	Series	Trim	Exterior/Interior Usage	Cylinder	Finish
DL27=Trilogy T2 Series		<b>00= Lever</b>	**Leave Blank for interior use  WP= Weather proof for exterior use	<b>IC= Standard Interchangeable core</b> key retained 7 Pin IC	<b>26D- Satin Chromium</b>



**C Series- Cores**



*1C core (standard)*



*6C core (4S display case)*

**How To order**

<b>1C</b>	<b>7</b>	<b>A</b>	<b>2</b>	<b>626</b>
<b>Core Type</b>	<b>Core Size</b>	<b>Keyway Code</b>	<b>Combination Code</b>	<b>Finish</b>
1C-Standard 6C- for 4S cylinders	7- 7 Pin	Designate specific keyway (A,E, etc)	2- Combined	605, 606, 612, 613, 625, 626

## Lock Troubleshooting

<b>You notice...</b>	<b>Possible causes include...</b>	<b>You should...</b>
Lever won't return to its normal position.		
	Lever return spring is broken.	The lever return spring will need to be replaced
	There is binding between the lever and rose.	The lock will have to be removed, centered and reinstalled the door.
Key spins freely, but won't retract the latch or unlock the door.		
	Throw member is not installed.	Install the throw member.
	6-pin core is installed with a 7-pin throw member.	Change the core or throw member.
Core doesn't fit into the lever core hole.		
	7-pin core is installed with a 6-pin throw member.	Change the core or throw member.
Latch doesn't retract.		
	Latch tailpiece is broken.	Replace the latch assembly.
	Latch tailpiece didn't engage the retractor correctly during installation.	Reinstall the lock chassis

## Key/Core Troubleshooting

You notice Issue (Key)...	Possible causes include...	You should...
It is difficult to insert or remove the key		
	Key's keyway is not compatible with the core.	Look at the end of the key and the keyway of the core. If the profiles do not match, check your <i>Masterkey Specification</i> to see what type of keyway must be used with the core.
	Key is damaged	Check the key to see whether it has been damaged. If it has, replace the key.
	There is foreign material on the key or in keyway of the core.	Check the key and the keyway of the core for foreign material. If there is foreign material, remove it with compressed air or LPS lubricant.
	Keyway of the core has been damaged.	Check the keyway of the core for damage. If it is damaged, contact your BEST Representative.
You notice Issue (Core)...	Possible causes include...	You should...
Core does not insert into cylinder/receptacle...		
	Core lug is not fully retracted.	Check behind the lug for any foreign material. Clean it as necessary.
	Throw pins inside the receptacle are not aligned with the holes in the core.	Check to see whether the throw pins are out of alignment. Use a screwdriver to align the throw pins with the throw pin holes in the core.
	There is foreign material in the cylinder/receptacle.	Check the cylinder/receptacle for foreign material. Clean it as necessary.
	For mortise locks only, the cylinder set screw is installed too tightly.	Remove the mortise case faceplate and loosen the cylinder set screw.



Bass Employee Initials: \_\_\_\_\_

**Bass Security Services, Inc.**  
26701 Richmond Road  
Cleveland, OH 44146-1449  
Phone: 216-755-1200 ext 1529 \* Fax: 216-755-1219  
E-mail: customersetup@bass-security.com

**CREDIT APPLICATION**

Name of Account: \_\_\_\_\_  
Address: \_\_\_\_\_  
City/State/ZIP: \_\_\_\_\_

Account Contact Numbers: Ph: \_\_\_\_\_ Fax: \_\_\_\_\_

Billing Address: \_\_\_\_\_  
*(if different from above)*

City/State/ZIP: \_\_\_\_\_

Accounts Payable Contact: \_\_\_\_\_

A/P Contact Numbers: A/P Phone: \_\_\_\_\_ A/P Fax: \_\_\_\_\_

E-Mail Address: Accounts Payable (required): \_\_\_\_\_

E-Mail Address: Other/Corporate (describe): \_\_\_\_\_

Nature of Business: \_\_\_\_\_

Corporation: \_\_\_\_\_ Partnership: \_\_\_\_\_ Individual Prop: \_\_\_\_\_

Yrs. In Business: \_\_\_\_\_ Credit Amount Request: \_\_\_\_\_ Fed ID# / SSN: \_\_\_\_\_

If Partnership or Individual Prop. , List Names of Partners or Officers:

1 \_\_\_\_\_ SSN: \_\_\_\_\_

2 \_\_\_\_\_ SSN: \_\_\_\_\_

3 \_\_\_\_\_ SSN: \_\_\_\_\_

Name of Bank: \_\_\_\_\_

Branch: \_\_\_\_\_

Type of Account: \_\_\_\_\_ Account No: \_\_\_\_\_

Business Credit References: *(include mailing address, phone no. & fax no.)*

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

4 \_\_\_\_\_

Sales Taxable?: Yes \_\_\_\_\_ No \_\_\_\_\_

**(If Tax Exempt, A CERTIFICATE MUST BE SUPPLIED OR SALES TAX MAY BE CHARGED)**

Persons Authorized to Purchase:

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

Is a Purchase Order Required? Yes \_\_\_\_\_ No \_\_\_\_\_

Payment Terms: Due NET 30 days From Bass Invoice date \_\_\_\_\_

The above information is given for the purpose of obtaining credit and warranted to be true. Permission is given to make further investigation as required to establish credit ability. It is agreed that all bills will be paid Net 30 days, and that accounts past that period are past due and subject to a monthly service charge of 2% per month on all past due balances. The undersigned further agrees to pay all expenses, including court costs, legal and administrative expenses, and attorney fees incurred by Bass Security Services, Inc. in endeavoring to collect the sums due. Authorized Signature, printed name of signor and Date signed is required for processing

**X** \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_



26701 Richmond Road

Cleveland, OH 44146

Local\* (888)-774-3400\* ext: 1529 FAX\* (615)-942-1174\*

CREDIT CARD PAYMENT AUTHORIZATION FORM

Instructions: email the Completed and signed form to [Customersetup@Bass-Security.com](mailto:Customersetup@Bass-Security.com)

Check one:    Visa \_\_\_ Discover \_\_\_ MasterCard \_\_\_ American Express \_\_\_

Credit Card #: \_\_\_\_\_

Exp. Date on Credit Card: \_\_\_\_\_ security code: \_\_\_\_\_

Name as appears on Card: \_\_\_\_\_

Company Name on Card (if applicable): \_\_\_\_\_

Credit Card Billing address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Telephone #: \_\_\_\_\_ Fax #: \_\_\_\_\_

This authority is for one time charge according to the information provided below:

Invoice /Sales order/work order # \_\_\_\_\_

Grand Total Payment Amount (including Sales tax) : \_\$ \_\_\_\_\_

Sales tax amt only\$ \_\_\_\_\_

I authorize Bass Security Service to charge my credit card for a onetime payment of their products and/or services. If Bass Security Service is unable to process my payment I will be responsible for an alternate payment arrangement.

By Signing this authorization, I acknowledge that I have read and agree to all of the above information and warrant all information given is true.

Signature of Card Holder: \_\_\_\_\_

Printed Name of Card Holder: \_\_\_\_\_

Date: \_\_\_\_\_







## SECTION 01 10 00 - SUMMARY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  1. Work covered by Contract Documents.
  2. Time for performance of the Work.
  3. Phased construction.
  4. Work performed by Owner.
  5. Work under Owner's separate contracts.
  6. Owner-furnished/Contractor-installed (OFCI) products.
  7. Contractor's use of site and premises.
  8. Coordination with occupants.
  9. Work restrictions.
  10. Specification and Drawing conventions.
  11. Miscellaneous provisions.

#### 1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. General: Contract Documents for this Project are issued in a single document release. Contractor awarded the Work is responsible for the entirety of scope contained in the package. The Work is defined by the Contract Documents and includes, but is not limited to, the following:
  1. Interior Alterations Package, including but not necessarily limited to:
    - a. Review and acceptance of site and construction area.
    - b. Temporary facilities and controls.
    - c. Receiving, Installation of Owner-furnished materials, equipment, and furnishings.
    - d. Construction waste management including diversion.
    - e. Construction to accommodate interior alterations and sales floor alterations including recessed proprietary standards and transitions to existing construction.
    - f. Line-voltage electrical power and lighting alterations.
    - g. Delegated design fire alarm system alterations.
    - h. Other such work indicated or required for the completion of the Work.
  2. Coordination with work contemporaneous to work of this Contract, including, but necessarily limited to:
    - a. Loose retail fixtures removal and reinstallation by Owner.
    - b. Wall perimeter retail fixtures by Owner.
    - c. Security and protection systems.
    - d. Loss prevention and asset protection systems.
    - e. Independent testing agencies and inspections.
    - f. Point-of-Sale (POS) communications and data systems.
    - g. Telephone, telecommunication, and data systems.
    - h. Other separate Owner's prime contractors.
  3. Coordination with Owner's forces contemporaneous to work of this Contract, including:

- a. Owner's separate shelving vendor.
- b. Owner's separate furnishings vendor.
- c. Owner's separate communications and data forces.
- d. Owner's Operations and fulfillment forces.
- e. Owner's loss prevention and security forces.
- f. Other separate Owner's forces.

- B. Type of Contract:
1. Project will be constructed under a single prime contract.

#### 1.4 TIME FOR PERFORMANCE OF THE WORK

- A. General: The Contract, including the Articles of Agreement, General Conditions and Supplementary Conditions of the Contract, contains dates, key dates, critical path dates, milestones, and other key dates that comprise the Contract Time.
1. Unless indicated otherwise, time is of the essence for completion of the Work.
- B. Key Dates: Construct the Work to meet Key Dates established in the Contract and Articles of Agreement, Contract Documents and construction schedule.
- C. Overtime and Premium Time: Include in proposals all costs including cost of overtime, shiftwork, premium time, or additional staffing as required to meet the Project schedule indicated.
- D. Commencement: Upon notification of award or notice to proceed, immediately commence the Work.
- E. Revisions: The Owner, in accordance with the Contract, may revise from time to time key or milestone dates or phases of construction within the overall construction schedule, maintaining the Contract Time and completion dates. Meet dates for performance of the Work in accordance with the Contract and Articles of Agreement.

#### 1.5 PHASED INTERIOR CONSTRUCTION

- A. General: In conjunction with Owner's separate primes, conduct the Work by the orderly progression, construction, and sequencing of the Work, each phase completed as part of the overall Preliminary Acceptance/Substantial Completion.
1. A single Certificate of Substantial Completion, on which warranties and other requirements of the Project will commence, is to be issued upon completion of the final Phase.
  2. Changes to phased construction do not constitute a change in scope.
- B. Contractor's Schedule: Before commencing Work of each phase, submit an updated copy of Contractor's construction schedule, coordinated for dates and activities, showing the sequence, commencement and completion dates for all phases of the Work.

#### 1.6 WORK PERFORMED BY OWNER

- A. General: Cooperate fully with Owner and Owner's separate primes, so the work may be carried out smoothly, without interfering with or delaying Work under this Contract or by the work by the Owner. Coordinate the Work of this Contract with work performed by Owner.
1. Completion of the Owner's work will depend on successful completion of preparatory Work under this Contract.

1.7 WORK UNDER OWNER'S SEPARATE CONTRACTS

- A. Work with Separate Contractors: Cooperate fully with Owner's separate contractors, so work on those contracts may be carried out smoothly, without interfering with or delaying Work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under Owner's separate contracts.
  - 1. Completion of the work under separate contracts will depend on successful completion of preparatory Work under this Contract.

1.8 OWNER-FURNISHED CONTRACTOR-INSTALLED (OFCI) PRODUCTS

- A. Owner-Furnished Contractor-Installed (OFCI) Products: Owner has negotiated or will within the course of the Work negotiate orders with suppliers of materials, equipment, and furnishings to be incorporated into the Work. Work includes:
  - 1. Receiving, unloading, hoisting, craning, setting, handling, and storage of Owner-furnished materials, equipment, and furnishings.
  - 2. Unpacking, uncrating, and removal of packaging materials, and disposal of related waste materials.
  - 3. Material quantity estimation and accounting for Owner-furnished materials, equipment, and furnishings during the Work, including confirmation of and aid to Owner in ordering of products.
  - 4. Inventory of bills of lading and comparison with Owner's ordering documentation at time of delivery.
  - 5. Installation of Owner-furnished materials, equipment, and furnishings.
- B. Owner's Responsibilities: Owner will furnish products indicated and:
  - 1. Purchase and deliver Owner-furnished products FOB to the Project site.
  - 2. Provide to Contractor Owner-reviewed Product Data, Shop Drawings, and Samples.
  - 3. Provide for delivery of Owner-furnished products to Project site, in conjunction with Contractor's scheduling.
  - 4. Upon delivery, inspect, with Contractor present, delivered items.
    - a. If Owner-furnished products are damaged, defective, or missing, arrange for replacement.
  - 5. Obtain manufacturer's inspections, service, and warranties.
  - 6. Inform Contractor of earliest available delivery date for Owner-furnished products.
- C. Contractor's Responsibilities: Work under this Contract includes:
  - 1. Within 10 days after receiving the Notice to Proceed, establish installation and shipping schedules for OFCI products directly with Owner's Representative and Owner's suppliers.
  - 2. Designate delivery dates of Owner-furnished products in Contractor's construction schedule, utilizing Owner-furnished earliest available delivery dates.
    - a. Time and expedite deliveries to ensure suppliers meet agreed upon dates.
    - b. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of space for storage and construction.
    - c. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
  - 3. Immediately notify the Owner of any delays or anticipated delays in deliveries.
  - 4. Inspect products upon delivery and compare with Owner's ordering information. Determine that products are complete, undamaged, and free of defects.
    - a. If Owner-furnished products are damaged, defective, or missing, Work with Owner to arrange for replacement.
  - 5. Review Owner-reviewed Product Data, Shop Drawings, and Samples, noting discrepancies and other issues in providing for Owner-furnished products in the Work.
  - 6. Receive, unload, and handle OFCI products.

- a. Handle delivered products using means and methods that will prevent damage, deterioration and loss, including theft and vandalism. Comply with manufacturer's written instructions for delivery, handling and storage.
  - b. Include all costs for receiving, handling, storage as required, inventory, accounting for materials, and installation or reinstallation in Contract Sum and Contract Time.
  - c. Furnish adequate personnel, tools, and equipment to promptly unload materials, equipment, and furnishings in accordance with instructions from carrier or supplier.
  - d. Promptly unload delivered materials, equipment, or furnishings.
7. Store and secure OFCI products. Protect OFCI products from damage during storage, handling, and installation and prior to Substantial Completion.
- a. Store products received until the time for their incorporation into the Work.
  - b. Avoid unnecessary moving of products beyond initial receipt. Plan construction staging and sequencing to minimize relocating products more than necessary.
8. Protect OFCI products according to requirements of Contract Documents and manufacturer's written requirements and recommendations
- a. Protect from damage or deterioration.
  - b. Protect from water or fire.
  - c. Protect products including hygroscopic materials and moisture-sensitive devices (MSD) from exposure, excess humidity, and wetting. Avoid exceeding component's Moisture Sensitivity Level (MSL).
9. Install OFCI products according to Contract Documents and manufacturer's written installation instructions and recommendations.
- a. Provide all materials, accessories, and auxiliary work necessary for installation, to make the Work fully functional, operating as designed.
  - b. Fasten and connect products to building. Secure and attach to structure using permanent connections.
  - c. Make building services connections for Owner-furnished products requiring connections.
  - d. Install products to comply with manufacturer's written requirements for general and special Project warranties.
10. Repair or replace Owner-furnished products damaged following receipt.

#### 1.9 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Use of Site: Contractor shall have use of Project site for construction operations during construction period within Contract limits. Contractor's use of Project site is limited by provisions of the Contract and Owner's right to perform work or to retain other contractors on portions of Project.
- B. Limits on Use: Limit use of Project site to Work in areas and areas within the Contract limits set by Owner. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
    - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
    - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Contractor Acceptance: Immediately upon receipt of the Notice to Proceed/Notice of Commencement, prior to commencing the Work, the Contractor and subcontractors assigned certain responsibilities by the Contractor shall inspect the site with the Owner and:
1. Inspect the building site, construction area, Work area boundaries, and surrounding area.
  2. Report in writing to the Owner any conditions not in accordance with Contract Documents or conditions that may impede timely completion of the Work.

- D. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
- E. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

#### 1.10 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy Project site and **[existing]** **[adjacent]** building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
  - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
  - 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.
- B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to place and install equipment in completed portions of the Work, prior to Preliminary Acceptance/Substantial Completion of the Work.
  - 1. Such placement of equipment and limited occupancy shall not constitute acceptance, in whole or in part, of the total Work or any part of it, regardless of completeness and compliance with Contract Documents.

#### 1.11 WORK RESTRICTIONS

- A. General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.
- B. Existing Utility or Services Interruptions: Do not interrupt utilities or service serving areas or facilities occupied by Owner or others unless permitted and then only after arranging for temporary utility services.
  - 1. Perform work that could interfere with ongoing occupancy and use off-hours, weekend hours, early morning or late day hours, or other times agreeable to Owner.
  - 2. If interrupted accidentally, immediately take action to restore utility or services as quickly as possible.
- C. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.
  - 1. Perform work that could interfere with ongoing occupancy and use off-hours, weekend hours, early morning or late day hours, or other times agreeable to Owner.
- D. Smoking and Controlled Substance Restrictions: Use of tobacco products is not permitted within the facility or within 25 feet (8 m) of entrances, openings, or outdoor air intakes. Use of alcoholic beverages and controlled substances of any kind on the Owner's property are not permitted.
- E. Employee Identification: Owner will implement screening and identification procedures for Contractor personnel working on Project site. Require personnel to obtain, use, and display identification at all times.
- F. Employee Screening: Comply with Owner's requirements for screening of Contractor personnel working on Project site.

1. Maintain list of approved screened personnel with Owner's representative.

#### 1.12 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
  3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
  4. Words may be implied or inferred but not stated. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable to the context.
  5. Omissions of words or phrases are intentional. Omitted words or phrases shall be supplied by inference in the same manner with the same meaning as a note occurring on Drawings.
  6. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Specifications Section Format: Sections generally use CSI "MasterFormat" conventions with six- or eight- digit unique numbers and titles. Sections in the Project Manual are in numeric sequence; however, the sequence may be incomplete by design dependent on the Work, or the phases and sequences of the Work.
- C. Division 00 Contracting Requirements: General provisions of the Contract, including Articles of Agreement, General and Supplementary Conditions, apply to all Sections of the Specifications.
- D. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- E. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  2. Abbreviations: Materials and products are identified by abbreviations on Drawings and as published as part of the U.S. National CAD Standard.
- F. Subdivision of Contract Documents: Separation of the Drawings into series, sheets, or details and separation of Specifications into Divisions and Sections is not intended to establish the limits of Contracts, subcontracts, or any division of labor. Contractor is solely responsible for divisions of labor and division of the Work into contracts and construction.
- G. Complementary Documents: Drawing and Specifications as part of Contract Documents shall be considered complimentary to one another, and requirements of one shall be considered the requirements of all.
1. Materials, products, and labor indicated or implied by Drawings or Specifications shall be provided, performed, and executed as though expressly required by both.
- H. Incomplete or Partial Sets: Owner and Architect assume no responsibility for errors, omissions, or interpretations by the Contractor for the use of incomplete or partial Contract Documents, or conditions resulting from the use of incomplete or partial sets.

Macy's Inc. Macy's - Interior Alterations

1. Contractor assumes all risk and sole responsibility for distributing Contract Documents, including changes to the Work, Construction Change Directives, Change Orders, RFI requests, and other communications of the Work.
2. Changes to the Contract Sum or Contract Time (Duration) will not be granted for any use of incomplete or partial sets.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00

## SECTION 01 25 00 - SUBSTITUTION PROCEDURES AFTER AWARD

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Administrative and procedural requirements for substitutions after award of the Contract.

#### 1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.
  - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
  - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

#### 1.4 ACTION SUBMITTALS

- A. Substitution Requests After Award: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Substitution Request Form: Use form provided in Project Manual.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
    - b. Coordination of information, including a list of changes, modifications, or revisions needed to other parts of the Work and to construction, including those that may be performed by Owner and separate contractors, which will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities and characteristics of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Samples, where applicable or requested.
    - f. Certificates and qualification data, where applicable or requested.
    - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.



- h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
  - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES or other agency acceptable to authorities having jurisdiction.
  - j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
  - k. Cost information, including a proposal of change, if any, in the Contract Sum.
  - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
  - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 5 days of receipt of a request for substitution. After consultation with the Owner after review of the request or review of additional information or documentation provided, whichever is later, Architect will complete the prescribed form indicating the Architect's action. Architect will notify General Contractor of acceptance or rejection of proposed substitution
- a. Forms of Acceptance: Owner's Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work. Substitutions may only be included in the Work by appropriate modification of the Contract.
  - b. Review and acceptance by the Owner or Architect is not to be construed as approval for the substitution, the Work or any portion, procedure, or process of the Work.
  - c. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.
- B. Procurement Substitutions: For substitution requests during procurement, comply with Division 00 Section "Procurement Substitution Procedures."

## 1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials.

## 1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.
- B. Compensation: For substitutions accepted, the change in Contract Sum shall be the sole and only compensation for the substitution. No additional compensation will be allowed for any additional work of any kind.
- C. Substitutions Made Without Request or Review: Substitutions made without the Architect and Owner's review and Owner's acceptance will be considered not compliant with the requirements of Contract Documents.

## 1.7 SUBSTITUTIONS

- A. General: No substitution is considered accepted simply because it is proposed or submitted.

- B. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
    - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
    - b. Requested substitution is demonstrated to be consistent with the design intent of the Contract Documents and will produce indicated results.
    - c. Substitution request is fully documented and properly submitted.
    - d. Requested substitution will not adversely affect Contractor's construction schedule.
    - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
    - f. Requested substitution is compatible with other portions of the Work.
    - g. Requested substitution has been coordinated with other portions of the Work.
    - h. Requested substitution provides or exceeds specified warranty.
    - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
    - j. Substitution does not require revisions to permit application or Contract Documents, unless the Contractor includes the cost for such revisions.
- C. Substitutions for Convenience: Owner and Architect will consider requests for substitution if received within 15 days after commencement of the Work. Requests received after that time may be considered or rejected at discretion of Owner and Architect.
1. Conditions: Architect will consider Contractor's request for substitution when conditions as outlined for substitutions for cause above are satisfied. If the conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:
    - a. General coordination procedures.
    - b. Coordination drawings.
    - c. RFIs.
    - d. Digital project management procedures.
    - e. Project meetings.

1.3 GENERAL COORDINATION PROCEDURES

- A. Participation: Each contractor shall participate in coordination requirements.
- B. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Memoranda: Prepare memoranda for distribution to each party involved,
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and scheduled activities of other contractors to avoid conflicts and to ensure orderly progress of the Work.

1.4 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
  - 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

- a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
  - b. Coordinate the addition of trade-specific information to coordination drawings in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
  - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
  - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
  - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
  - f. Indicate required installation sequences.
  - g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
2. Fire-Protection System: Include the following:
    - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
  3. Plumbing System, as Applicable: Include the following:
    - a. Locations of piping, branch lines, pipe drops, valves and access doors.
  4. Mechanical System: Include the following:
    - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
  5. Electrical System: Include the following:
    - a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
    - b. Light fixtures, exit lights, emergency lighting and signs, smoke detectors, and fire-alarm appliance locations.
    - c. Panel board, switchboard, switchgear, transformer, busway, generator, and motor-control center locations.
    - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
  6. Review: Architect may review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
- B. Coordination Drawing Process: Prepare coordination drawings in the following manner:
1. Schedule submittal and review of Fire Sprinkler, Plumbing, HVAC, and Electrical Shop Drawings to make required changes prior to preparation of coordination drawings.
  2. Commence routing of coordination drawing files with HVAC Installer, who will provide drawing plan files denoting approved ductwork. HVAC Installer will locate ductwork and piping on a single layer, using orange color. Forward drawings to Plumbing Installer.
  3. Plumbing Installer will locate plumbing and equipment on a single layer, using blue color.
  4. Fire Sprinkler Installer will locate piping and equipment, using red color. Fire Sprinkler Installer shall forward drawing files to Electrical Installer.
  5. Electrical Installer will indicate service and feeder conduit runs and equipment in green color. Electrical Installer shall forward drawing files to Communications and Electronic Safety and Security Installer.
  6. Communications and Electronic Safety and Security Installer will indicate cable trays and cabling runs and equipment in purple color. Communications and Electronic Safety and Security Installer shall forward completed drawing files to Contractor.

7. Contractor shall perform the final coordination review. As each coordination drawing is completed, Contractor will meet with Architect to review and resolve conflicts on the coordination drawings.

C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. File Submittal Format: Submit or post coordination drawing files using PDF format.
2. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
  - a. Contractor shall execute a data licensing agreement in the form of Agreement included in this Project Manual.

1.5 REQUEST FOR INFORMATION (RFI)

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

1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
3. Failure to submit or resolve an RFI shall not relieve the Contractor of providing Work to comply with the Contract Documents, without increase in Contract Sum or Contract Time.
4. If at any time a product, component, or portion of the Work or Contract Documents unsuitable or otherwise contrary to the conditions of service or installation, submit a written RFI for clarification.
5. Owner or Architect are not responsible for qualifications or claims made by the Contractor unless Contractor clearly explains in writing such explanations or claims and the Owner accepts those qualifications or claims by modification of the Contract.
6. In the event the Contractor delays or does not submit a timely RFI, and that delay is found to be favorable to the Contractor in the opinion of the Owner or Architect, any and all costs to comply with the Architect's response are solely the Contractor's responsibility.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation.

C. RFI Forms: Form bound in Project Manual.

1. Attachments shall be electronic files in PDF format.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow 5 working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:
  - a. Requests for approval of submittals.
  - b. Requests for approval of substitutions.
  - c. Requests for approval of Contractor's means and methods.
  - d. Requests for interpretation of building, zoning, or other code statutes or regulations.
  - e. Requests for coordination information already indicated in the Contract Documents.
  - f. Requests for adjustments in the Contract Time or the Contract Sum.
  - g. Requests for interpretation of Architect's actions on submittals.
  - h. Requests that include stipulations for immediate response or response within 1 working day, unless previously approved by Owner and Architect.
  - i. Incomplete RFIs or inaccurately prepared RFIs.
2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
3. Advise Architect in follow up communication requesting response at least 24 hours prior to requested date of response, if by that time response has not yet been received.

- E. Affected Portions of Work: Do not proceed with affected portions the Work until receipt of the Architect's response, or Owner has directed in writing continuation of the Work in affected areas.
- F. Change of Contract Sum: If Contractor the Architect's response changes the Contract Sum, notify Owner with immediate written notice of claim and follow up with request for Change Order or Construction Change Directive within 3 working days, for Owner's direction.
  - 1. Do not proceed with affected portions of the work for which claims area made without written direction from the Owner or by Change Order or Construction Change Directive.
- G. Minor Change to the Work: Perform minor changes to the Work contained within Architect's RFI response as minor changes not affecting the Contract Sum.
- H. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number.
- I. Updating Log: On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within 3 days if Contractor disagrees with response.

#### 1.6 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. Use of Architect's Digital Data Files: Digital data files of Architect's CAD drawings will be provided by Architect for Contractor's use during construction.
  - 1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
  - 2. Contractor shall execute a data licensing agreement in the form of the Agreement included in Project Manual.
    - a. Subcontractors and other parties granted access by Contractor to Architect's digital data files shall be governed and bound by the terms and conditions of the digital data agreement.
- B. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:
  - 1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
  - 2. Name file with submittal number or other unique identifier, including revision identifier.
  - 3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

#### 1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
  - 1. Review procedures, restriction, and priorities. Discuss items of significance that could affect progress. Identify critical work sequencing and long lead items. Create action plans to resolve issues of procurement or construction scheduling.
    - a. All participants at meetings or conferences shall be familiar with Project and authorized to act and conclude matters relating to the Work.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner, but no later than 5 calendar days after execution of the Agreement.
  - 1. Discuss items of significance that could affect performance of the completed construction or affect progress of the Work. Conduct the conference to review responsibilities and assignments and other such activities as may be required to commence and conduct the Work.

- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.
  - 1. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
  
- D. Project Preliminary Acceptance/Substantial Completion Conference: Schedule and conduct a Project completion conference, at a time convenient to Owner, but no later than 10 calendar days prior to the scheduled date of Preliminary Acceptance/Substantial Completion.
  - 1. Conduct the conference to review requirements and responsibilities related to Preliminary Acceptance/Substantial Completion and Project closeout including:
    - a. Procedures required prior to inspection by authorities having jurisdiction for occupancy for Preliminary Acceptance/Substantial Completion and for final jurisdictional inspections.
    - b. Requirements for preparing operations and maintenance data.
    - c. Requirements for delivery of material samples, attic stock, and spare parts.
    - d. Requirements for demonstration and training.
    - e. Preparation of Contractor's punch list.
    - f. Procedures for processing Applications for Payment at Preliminary Acceptance/Substantial Completion and for final payment.
    - g. Procedures for submittal of waivers of liens.
    - h. Submittal procedures.
    - i. Coordination of separate contracts.
    - j. Owner's partial occupancy requirements.
    - k. Contractor's responsibilities during Owner's partial occupancy.
    - l. Submittal of other legal documents.
    - m. Procedures for resolving any outstanding claims or pending change orders.
  
- E. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 15 days after to the scheduled date of Preliminary Acceptance/Substantial Completion.
  - 1. Conduct the conference to review requirements and responsibilities related to Project closeout including:
    - a. Items of significance that could affect or delay Project closeout.
    - b. Preparation of Record Documents.
    - c. Procedures required for final inspection for acceptance.
    - d. Procedures for completing and archiving web-based Project software site data files.
    - e. Submittal of written warranties.
    - f. Delivery of operations and maintenance data.
    - g. Delivery of material samples, attic stock, and spare parts.
    - h. Receipts for demonstration and training.
    - i. Resolution of Contractor's punch list.
    - j. Procedures for processing Applications for Payment for final payment.
    - k. Installation of Owner's furniture, fixtures, and equipment.
    - l. Responsibility for removing temporary facilities and controls.
  
- F. Progress Meetings: Conduct progress meetings at regular intervals, appropriate to pace and activities of work. Monitor milestones for completion.
  - 1. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 2. Coordinate dates of meetings with preparation of payment requests.
  - 3. Conduct a separate meeting with the Owner to review items of significance, costs and change orders, and progress.
  - 4. Review progress. Determine whether each activity is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss steps required to ensure that current and subsequent activities will be completed within the Contract Time. Review schedule for next period and present and future needs.

- G. Minutes and Memoranda: Entity conducting meeting will record and distribute meeting minutes.
- H. Coordination Meetings: Conduct Project coordination meetings at appropriate intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
  - 1. Each subcontractor shall participate in coordination requirements. Certain areas of responsibility are assigned by the Contractor to a specific subcontractor.
  - 2. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 3. Review other items of significance that could affect progress or quality of installation.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00



SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Administrative and procedural requirements for documenting the progress of construction during performance of the Work.

1.3 COORDINATION

- A. General: Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, Owner-furnished products, Owner's separate forces, progress and other reports, payment requests, and other required schedules and reports.
  - 1. Secure time commitments for performing critical elements of the Work from entities involved.
  - 2. Coordinate each construction activity in the network with other activities, and schedule them in proper sequence.

1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Time Frame: Extend schedule from the Notice to Proceed, through the date established for commencement of the Work and Preliminary Acceptance/Substantial Completion, and to Final Acceptance/Final Completion.
- B. Activities: Prepare a list of all activities required to complete the Work. Comply with the following:
  - 1. Activity Duration: Define activities with durations in calendar days.
  - 2. Procurement Activities: Include procurement process activities for long lead-time items and major items as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
  - 3. Submittal Review Time: Include review and resubmittal times in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
  - 4. Sequences: Indicate sequences of activities and relationship of each activity in relation to other activities. Clearly show the relationship of an activity to preceding and succeeding activities.
  - 5. Startup and Testing Time: Include time for startup and testing.
  - 6. Preliminary Acceptance/Substantial Completion: Indicate completion in advance of date established for Preliminary Acceptance/Substantial Completion. Allow time for administrative procedures and jurisdictional approvals.
  - 7. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and Final Acceptance/Final Completion.
- C. Constraints: Include constraints, Owner-furnished products, work stages, and work restrictions as anticipated by the Work.

- D. Milestones: Include milestones established by the Owner and Contractor.
- E. Initial Schedule: Prepare and submit initial construction schedule to Owner within 10 working days of date established from the Notice to Proceed.
- F. Upcoming Work Summary (Look Ahead Schedule): Prepare schedule indicating activities scheduled to occur or commence prior to submittal of next schedule update.
- G. Contractor's Construction Schedule Updating: At regular intervals not exceeding 10 working days, update schedule to reflect actual construction progress and activities. Issue schedule before each regularly scheduled progress meeting.
  - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
  - 2. Where activities or events warrant, increase frequency of updating and republishing schedule.
- H. Recovery Schedule: When periodic update indicates the Work is 10 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.
- I. Distribution: Distribute copies of approved schedule to Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
  - 1. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

#### 1.5 STARTUP CONSTRUCTION SCHEDULE

- A. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first [90] <Insert number> days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

#### 1.6 REPORTS

- A. Material Location Reports: At regular intervals but not less than monthly, prepare and submit a comprehensive list of materials delivered to and stored at Project site. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 32 00

## SECTION 01 33 00 - SUBMITTAL PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Administrative and procedural requirements for submittals.
- B. Contract Requirements: The Contract including Articles of Agreement contains additional requirements.

#### 1.3 SUBMITTAL FORMATS

- A. Submittal Information: Include the following information in each submittal:
  - 1. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
  - 2. Category and type of submittal.
  - 3. Submittal purpose and description.
  - 4. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
  - 5. Drawing number and detail references, as appropriate.
  - 6. Indication of full or partial submittal.
  - 7. Location(s) where product is to be installed, as appropriate.
  - 8. Dimensions, clearances, tolerances, weights, and other physical parameters as applicable.
  - 9. Products and options applicable.
  - 10. Other necessary identification.
  - 11. Remarks.
  - 12. Contractor's uniform stamp of review and approval.
  - 13. Signature of transmitter.
- B. Options and Selections: Identify options, accessories, ancillary materials, and items requiring selection by Architect. Cross out all information and options, accessories, and ancillary materials that are not relevant to Project. Where selection is required, highlight item and notate to bring to Architect's attention.
- C. Deviations and Additional Information: Clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate deviations by highlighting and noting to bring to Architect's attention or noting on attached separate sheet.
- D. Electronic Submittals: Prepare submittals as PDF package file. Name PDF file with submittal number.

#### 1.4 SUBMITTAL PROCEDURES

- A. General: Prepare and submit submittals required by individual Specification Sections.

1. Email: Prepare submittals as PDF package and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.
  - a. Architect will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities, fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
- C. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
- D. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, and authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- E. Use for Construction: Use only final action submittals that are marked with reviewed notation from Architect's action stamp.

#### 1.5 SUBMITTAL REQUIREMENTS

- A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
  1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
- B. Jurisdictional Submittals: Submit copies to authorities having jurisdiction if required by that jurisdiction, in the format required by authorities. Do not copy Architect.

#### 1.6 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with Contractor's approval stamp before submitting to Architect.
  1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.
- B. Project Submittals to Architect: Submit the following to the Architect:
  1. Door Hardware.
  2. Additional items indicated.
- C. Project Submittals to Engineer: Submit the following to the Engineers with transmittal copy to Architect (Concurrent Submittal):
  1. Modifications to Water-Based Fire Protection Systems.
  2. Light fixtures and lighting controls, as applicable.
  3. Additional items indicated in Drawings or individual Specification Sections.

#### 1.7 ARCHITECT'S REVIEW

- A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required, and return to Contractor.
  1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action.
  2. Incomplete submittals will be returned for resubmittal without review.

3. Architect will discard submittals received from sources other than Contractor.
4. Submittals not required by the Contract Documents will be returned by Architect without action.

B. Architect's Review: Architect's review is for general conformance with the design intent of the Contract Documents. Review is not intended, nor is to be construed as, approval of any material, product, feature, option, means, methods, procedures, or other characteristics or processes of construction, all of which remain the purview of the Contractor. Approvals including that for construction remains solely the responsibility of the Contractor.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 33 00

## SECTION 01 35 16 - ALTERATION PROJECT PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Special procedures for alteration work.
  - 2. Administrative and procedural requirements governing:
    - a. Concealed conditions.
    - b. Unexpected conditions.
    - c. Discovery of conditions requiring Architect's interpretation.
    - d. Architect's actions to render interpretation of condition.
    - e. Contractor's course of action for concealed conditions.
    - f. Contractor's course of action for unexpected conditions, including claims procedures.

#### 1.3 DEFINITIONS

- A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.
- B. Condition, Concealed: Construction and other conditions that appear materially consistent with:
  - 1. Similar examples or surroundings;
  - 2. Conditions that can be reasonably anticipated, expected, or inferred though not readily observable;
  - 3. Are consistent with industry standards and practices when built or previously remodeled;
  - 4. Are consistent with type of construction, assembly, or subassembly present;
  - 5. Can be reasonably anticipated, expected, or inferred based on age, precedent, pattern, materials, methodology, assembly, physical, or other properties or characteristics; or
  - 6. Could or should have been reasonably anticipated, expected, or inferred by Contractor's prior observation, examination, investigation, or analysis of conditions.
- C. Condition, Unexpected: Construction and other conditions that:
  - 1. Materially, substantially, and detrimentally differ from similar examples or surroundings;
  - 2. Conditions that reasonably could not have been anticipated, expected or inferred prior to discovery;
  - 3. Conditions are outside the control of the Contractor; and
  - 4. Conditions that a Contractor's prior observation, examination, investigation, or analysis could not have reasonably expected prior to their discovery.
- D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.

- F. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.
- G. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.
- H. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.
- I. Retain: To keep an element or detail secure and intact.

#### 1.4 COORDINATION

- A. Alteration Work Subschedule: A construction schedule coordinating the sequencing and scheduling of alteration work for entire Project, including each activity to be performed, and based on Contractor's Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for alteration work.
  - 1. Schedule construction operations in sequence required to obtain best Work results.
  - 2. Coordinate sequence of alteration work activities to accommodate the following:
    - a. Owner's continuing occupancy of portions of existing building.
    - b. Owner's partial occupancy of completed Work.
    - c. Other known work in progress.
    - d. Tests and inspections.
  - 3. Detail sequence of alteration work, with start and end dates.
  - 4. Utility and Other Services: Indicate how long utility and other services will be interrupted. Coordinate shutoff, capping, and continuation of utility services.
  - 5. Equipment Data: Coordinate gross loaded weight, axle-load distribution, and wheelbase dimension data for mobile and heavy equipment proposed for use in existing structure. Do not use such equipment without ensuring that the structure can support the imposed loadings without damage.
- B. Pedestrian and Vehicular Circulation: Coordinate alteration work with circulation patterns within Project Work area, facility, and site. Work may be near circulation patterns and adjacent to restricted or secure areas. Unless otherwise permitted, main and accessible circulation patterns cannot be closed off entirely. Circulation may be temporarily redirected around areas of work, limited by requirements to maintain lawful legal egress and exiting, and maintaining accessible routes according to codes and standards in effect. Plan and execute the Work accordingly.

#### 1.5 PROJECT MEETINGS FOR ALTERATION WORK

- A. Preliminary Conference for Alteration Work: Before starting alteration work, conduct conference at Project site with subcontractors, suppliers, and others contracted to perform the Work to discuss, finalize, and verify availability of materials, specialists' and other personnel, equipment, and facilities needed to make progress and avoid delays.
  - 1. Discuss items of significance that could affect progress and sequences of alteration work operations.
  - 2. Review Project requirements and conditions.
  - 3. Review fire-protection prevention plans and security requirements.
- B. Coordination Meetings: Conduct coordination meetings specifically for alteration work at **weekly** intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

## 1.6 QUALITY ASSURANCE

- A. Alteration Work Program: Prepare a written plan for alteration work for whole Project, including each phase or process and protection of surrounding materials during operations. Show compliance with indicated methods and procedures specified in this and other Sections. Coordinate this whole-Project alteration work program with specific requirements of programs required in other alteration work Sections.
- B. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.

## 1.7 STORAGE AND HANDLING OF SALVAGED MATERIALS

- A. Salvaged Materials:
  - 1. Clean loose dirt and debris from salvaged items unless more extensive cleaning is indicated.
  - 2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
  - 3. Store items in a secure area until delivery to Owner.
  - 4. Transport items to Owner's storage area designated by Owner.
  - 5. Protect items from damage during transport and storage.
- B. Salvaged Materials for Reinstallation:
  - 1. Repair and clean items for reuse as indicated.
  - 2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
  - 3. Protect items from damage during transport and storage.
  - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.
- C. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.
- D. Storage: Catalog and store items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.
  - 1. Identify each item for reinstallation with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
  - 2. Secure stored materials to protect from theft.
  - 3. Control humidity so that it does not exceed 85 percent. Maintain temperatures 5 deg F (3 deg C) or more above the dew point.
- E. Storage Space:
  - 1. Owner will arrange for and designate limited on-site location or locations for free storage of salvaged material.
  - 2. Where required and permitted by Owner, arrange for off-site locations for storage and protection of salvaged material that cannot be stored and protected on-site.



1.8 PROJECT CONDITIONS

- A. Discrepancies: Notify Owner of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.
- B. Owner's Removals: Before beginning alteration work, verify in correspondence with Owner that certain items to be removed by the Owner have been removed.
- C. Size Limitations in Existing Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within existing spaces, areas, rooms, and openings, including temporary protection.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 DISCOVERY AND DISPOSITION OF CONDITIONS

- A. Discovery, Concealed Conditions: Upon Contractor's discovery of concealed conditions, Contractor shall continue to perform work, unless Contractor requests Architect's action to interpret condition and an unexpected condition is determined to exist by the Architect. Contractor is to make modifications as agreed upon by Architect and its consultants as required for concealed conditions found to complete the Work without change to the Contract Sum and Contract Time.
- B. Discovery, Conditions Requiring Interpretation: Immediately upon Contractor's discovery of conditions requiring Architect's interpretation and determination of condition, provide written notice to the Architect for the Architect's determination if an Unexpected Condition exists. Provide written request for interpretation by Architect through Architect's RFI.
  - 1. Refer to Division 01 Section "Project Management and Coordination" for form and format of Architect's RFI.
- C. Architect's Interpretation of Conditions: Architect shall interpret and decide which of the defined conditions exists and prevails, and which requirements will then govern. Architect may request Contractor to provide additional or supplementary information, or request supplemental investigation to be undertaken by the Contractor, including destructive investigation or analysis by others, in order to make a determination.
  - 1. If the Architect finds that the condition meets requirements of a concealed condition not subject to a claim, upon receiving Architect's response, Contractor shall immediately continue to perform work and make modifications as required by conditions found to complete the Work within the Contract Sum and Contract Time, unless otherwise instructed.
    - a. Concealed conditions shall not form the basis for a claim or claims.
    - b. Contractor shall perform work in accordance with Architect's decision with no change in Contract Sum or Contract Time (duration).
  - 2. If the Architect finds that the condition meets requirements of an unexpected condition subject to a claim, Contractor shall give written notice of claim within 3 working days from receipt of response, or the time indicated in the Contract, whichever is less, and await Owner's direction prior to proceeding with the Work.
    - a. No claims may be made for extension of Contract Time unless specifically and in writing approved by the Owner.
  - 3. Refer to Division 01 Section "Project Management and Coordination" for additional requirements regarding interpretations and other requests of the Architect for information.

- D. Claims for Unexpected Conditions: Contractor shall file any approved claim for unexpected conditions within limitations of the Contract.
  - 1. Refer to Division 01 Section "Contract Modification Procedures" for procedures regarding Construction Change Directives, Change Orders, and changes to the Contract Sum.

### 3.2 PROTECTION

- A. General: Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.
  - 1. Use only proven protection methods, appropriate to each area and surface being protected.
  - 2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
  - 3. Erect temporary barriers to form and maintain fire-egress routes.
  - 4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
  - 5. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
  - 6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
  - 7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
- B. Temporary Protection of Materials to Remain:
  - 1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
  - 2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.
- C. Protections: Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
- D. Utility and Communications Services:
  - 1. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
  - 2. Maintain existing utilities and services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.
- E. Existing Drains: Prior to the start of work, test drainage system to ensure that it is functioning properly. Notify Owner immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.
  - 1. During construction, prevent solids, semi-solids, residue, or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by alteration work.
  - 2. Protect drains from pollutants, allowing only clean water to pass.

### 3.3 PROTECTION FROM FIRE

- A. General: Follow fire-prevention plan and the following:
  - 1. Comply with NFPA 241 requirements unless otherwise indicated. Perform duties titled "Owner's Responsibility for Fire Protection."
  - 2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
    - a. If combustible material cannot be removed, provide fire blankets to cover such materials.

- B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:
  - 1. Use means to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
  - 2. Prevent the spread of sparks and particles of hot metal.
  - 3. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:
    - a. Train each fire watch in the proper operation of fire-control equipment and alarms.
    - b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.
    - c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
    - d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
- C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and waste containers for the disposal of rags with combustible liquids designed to prevent spontaneous combustion. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire extinguisher and blanket use, and waste can lids are kept closed.
- D. Sprinklers: Maintain sprinkler suppression and fire protection systems including notification devices functional, to permit operation without interruption while construction activities are performed. If working close to sprinklers, temporarily shield them to prevent accidental activation or where required by risk of activation, remove portion of system temporarily from service and restore to service when work is complete, but not later than the end of each workday.

### 3.4 GENERAL ALTERATION WORK

- A. Supervisory Personnel: Ensure that supervisory personnel are present when work begins and during its progress.
- B. Specialty Work: Have specialty work performed only by qualified specialists.
- C. Monitoring: Regularly inspect, survey, and monitor the Work of the Project as work progresses to detect hazards resulting from alterations.
- D. Changes in Building: Notify Owner immediately of visible or suspected changes in the integrity of material or components whether from structural defects including cracks, movement, displacement, deflection, or distortion, environmental causes, deterioration or degradation, temperature or humidity changes or extremes, or other factors.

END OF SECTION 01 35 16

SECTION 01 35 19 - SPECIAL PROJECT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Administrative and procedural requirements for:
    - a. Permits, notices, fees, licenses, and taxes.
    - b. Meetings with municipal officials.

1.3 PERMITS, NOTICES, FEES, LICENSES, AND TAXES

- A. General: Prepare, file, and give notice, secure and pay for notices, permits, licenses, fees, and taxes necessary and required for the proper and legal execution of the Work. Pay all direct and incidental costs and charges associated with the preparation, application for, and procurement of notices, permits, governmental approvals, licenses, and certifications, to comply with administrative and procedural requirements of the Work and to comply with authorities having jurisdiction, and public and private entities, including public and private utilities.
  - 1. Investigate and prepare applications, apply, file, and procure permits and licenses, file, procure, and receive notices, and pay fees and taxes, in a timely manner to avoid delay.
  - 2. Pay any and all costs associated with the failure to properly file and procure permits and licenses, pay fees and taxes.
  - 3. Pay any and all costs associated with any adjudication, orders, or fines, failures of inspections, or failure to comply with orders or directions of authorities having jurisdiction.
  - 4. In the event work is constructed or performed contrary to regulations, ordinances, laws, codes or standards in effect, or orders of authorities having jurisdiction, whether intentional or unintentional, the Contractor is solely responsible to correct non-conforming Work.
- B. Permits, Notices and Fees: Give written notice to authorities having jurisdiction and others, comply with governing codes, standards, regulations, ordinances, laws, directives, and orders of jurisdictional authorities, whether public or private, required or in effect for performance of the Work. Pay all permits, notices, and fees required for the performance of the Work including those required from authorities having jurisdiction, including, but are not limited to the following:
  - 1. Permits for the work include those for the work of specific trades, excluding:
    - a. General building permit and application fees filed by the Owner or Architect.
  - 2. Permits, notices, and fees pertaining to cranes, booms, lifts, scaffolding, and similar equipment.
  - 3. Permits, notices, and fees pertaining to temporary facilities and controls.
  - 4. Permits, notices, and fees pertaining to transport of materials, finished goods, and equipment for installation in the Work.
  - 5. Permits, notices, and fees pertaining to street use and blockage, revocable street privileges, and other similar use of the public right-of-way.
  - 6. Permits, notices, and fees for utility connections to municipal or private systems and similar items.
- C. Licenses: Pay all licenses required of Contractors for the performance of the Work including:

1. Business licenses.
2. State and other licenses for the practice of certain Trade Contractors.
3. Manufacturer's product licensing.
4. Licensing agreements for the use of products, software, or other intellectual property.
5. Vehicular and other licenses.

D. Taxes: Pay all local, state, and federal taxes as a result of the performance of the Work. Pay taxes as required by the State and jurisdiction in which the Project is located, or other authorities having jurisdiction, including, but are not limited to, taxes on products, goods, labor, installation, and other services.

1. Coordinate and cooperate with Owner to identify taxes paid for Project and complete Owner's taxable calculation forms, if applicable.

E. Owner's Responsibility for Taxes: Owner shall pay all taxes on Owner-furnished Contractor-Installed (OFICI) products.

#### 1.4 INFORMATIONAL SUBMITTALS

A. Records: Submit copies of permits, licenses, certifications, inspection and other reports, releases, jurisdictional settlements, approvals, notices, receipts for fee payments, judgments, and similar licenses, approvals and certifications established for compliance with codes and standards in effect bearing on performance and completion of the Work.

1. Submit copies of records to Owner.
2. Submit copy of final Certificate of Occupancy to Owner and Architect.

#### 1.5 MEETINGS WITH MUNICIPAL OFFICIALS

A. Special Meetings: Where required, schedule meetings between relevant parties and authorities having jurisdiction or other officials of the municipality under which the Project is governed. Organize and conduct meetings to comply with requirements of Division 01 Sections. Record, publish and distribute written results, decisions, and findings.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 35 19

## SECTION 01 40 00 - QUALITY REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Administrative and procedural requirements for quality assurance and quality control.
  - 2. Testing and inspection services required to verify compliance.

#### 1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of 5 years of projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
  - 1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).
- D. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- E. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).
- F. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."
- G. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

- H. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect.

#### 1.4 DELEGATED DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
  - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
  - 2. Where required by authorities having jurisdiction, prepare and submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include affidavits, list of codes, loads, and other factors used, and other information required by the jurisdiction in performing these services.

#### 1.5 CONFLICTING REQUIREMENTS

- A. Conflicting Codes or Standards and Other Requirements: If compliance with two or more codes or standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect in writing regarding the conflict and obtain clarification prior to proceeding with the Work. Clearly identify nature of conflict. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.
  - 1. In the event work is constructed or performed contrary to regulations, ordinances, laws, codes or standards in effect, or orders of authorities having jurisdiction, whether intentional or unintentional, the Contractor is solely responsible to correct non-conforming Work.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum quantity or quality specified within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

#### 1.6 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Institute quality-control plan within 10 working days of Notice to Proceed, and not less than 5 working days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality control responsibilities and to coordinate Owner's quality-assurance and quality control activities. Coordinate with Contractor's Construction Schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
  - 1. Project quality-control manager may also serve as Project superintendent or independent personnel or entity.

- C. Submittal Procedure: Institute procedures for ensuring compliance with requirements through review and management of submittal process.
- D. Testing and Inspection: Develop and institute a comprehensive schedule of Work requiring testing or inspection, including the following:
  - 1. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
  - 2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
- E. Continuous Inspection of Workmanship: Institute process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Establish types of corrective actions to be required to bring the Work into compliance with standards of workmanship established by Contract requirements.
- F. Monitoring and Documentation: Maintain testing and inspection reports, including log of approved and rejected results. Include Work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming Work into compliance with requirements. Comply with requirements of authorities having jurisdiction.
- G. Limitations: Provisions of this Section do not limit requirements for Contractor to provide quality-assurance and quality control services required by Architect, Owner, or authorities having jurisdiction. Testing and inspection services do not relieve Contractor of responsibility for compliance with requirements of the Contract Documents.
  - 1. Specific tests, inspections, and related actions do not limit or definitively outline Contractor's other quality-assurance and quality control procedures that facilitate compliance with the Contract Document requirements.

#### 1.7 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports required by authorities having jurisdiction or otherwise specified in other Sections. Where applicable, include recommendations for corrections and retesting.

#### 1.8 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.



- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally and professionally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.
- F. Specialists Qualifications: A firm or individual who are recognized experts in those operations and experienced in installing, erecting, applying, or assembling specialized work similar in material, design, and extent to that indicated for this Project. Specialists shall satisfy qualification requirements indicated and engage in the activities indicated.
  - 1. Requirements of authorities having jurisdiction supersede requirements for specialists.
- G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

#### 1.9 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
  - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
  - 2. Costs for retesting and re-inspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform and pay for additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
  - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  - 2. Engage a qualified testing agency to perform quality-control services.
    - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  - 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
  - 4. Submit a certified written report, in duplicate, of each quality-control service.
  - 5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  2. Interpret tests and inspections to determine conformance or to record non-conforming work.
  3. Retest and reinspect where initial testing and inspection reveal non-conforming work.
  4. Do not release, revoke, alter, decrease, or increase requirements of the Contract Document or approve or accept any portion of the Work.
  5. Do not perform duties of Contractor.
- E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Sections.
- F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- G. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
  4. Facilities for storage of test samples.
  5. Delivery of samples to testing agencies.
  6. Security and protection for samples and for testing and inspection equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Testing and Inspections: Test results, or the absence of results, performed by the Owner's Testing Agency shall not limit or substitute for the Contractor's own quality assurance and quality control programs.
1. Contractor is not to rely on the Owner's Testing Agency as a substitute for the Contractor's own quality assurance and quality control programs.
  2. Actions of the Owner's Testing Agency shall not relieve Contractor of its requirement to conduct its own quality-assurance and quality control programs and shall not relieve the Contractor of its requirements to comply with the Contract Documents.

1.10 SPECIAL TESTS AND INSPECTIONS

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
- B. Log: Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for authorities' having jurisdiction and others' reference during normal working hours.
  - 1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR

- A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes. Repair is the Contractor's responsibility, regardless of the assignment of responsibility for quality control services.
  - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
  - 2. Comply with the requirements of the Contract Document and Division 01 Section "Execution" for cutting and patching.

3.3 PROTECTION

- A. General: Protect construction exposed by or for quality-control service activities.
  - 1. Protection is the Contractor's responsibility, regardless of the assignment of responsibility for quality control services.

END OF SECTION 01 40 00

SECTION 01 41 13.42 - CODES AND STANDARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect and authorities having jurisdiction; where requirements conflict, comply with the most stringent provisions. Comply with edition in effect as adopted by authorities having jurisdiction, including amendments and appendices. Select, provide, and construct the Work to comply with codes and standards in effect, including:
  - 1. 2018 Washington State Building Code, Chapter 51-50 WAC, 2018 International Building Code (IBC) as amended.
  - 2. 2018 Washington State Existing Building Code, 2018 International Existing Building Code (IEBC) as amended.
  - 3. 2018 Washington State Fire Code, Chapter 51-54A WAC, 2018 International Fire Code (IFC) as amended.
  - 4. 2018 Washington State Mechanical Code, Chapter 51-52 WAC, 2018 International Mechanical Code (IMC) as amended.
  - 5. 2018 Washington State Energy Code, Chapter 51-11C WAC, 2018 International Energy Conservation Code (IECC) as amended.
  - 6. National Electrical Code 2020 of Washington including NFPA 70.
  - 7. Codes and provisions of Pierce County, Washington.
  - 8. Code and provisions of Puyallup Municipal Code including:
    - a. Title 16 Fire.
    - b. Title 17 Buildings and Construction.
  - 9. Hauling and waste material disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with standards in effect and authorities having jurisdiction including:
  - 1. American National Standards Institute (ANSI).
  - 2. American Society of Testing and Materials (ASTM).
  - 3. Code of Federal Regulations (CFR) including:
    - a. CFR Title 29, Part 1910 "Occupational Safety and Health Standards."
    - b. CFR Title 29, Part 1926 "Safety and Health Regulations for Construction."
  - 4. United States Environmental Protection Agency (EPA).
  - 5. National Fire Protection Association (NFPA) including:
    - a. NFPA 13-16 "Standard for the Installation of Sprinkler Systems."
  - 6. Underwriters Laboratory (UL).
  - 7. Other standards in effect by the authorities having jurisdiction (AHJ).
  - 8. Other standards indicated in individual Sections or on Drawings.

1.3 ACCESSIBILITY

- A. General: Construct the Work, including any changes in the Work, to comply with the most stringent provisions of the following:

1. Codes and standards in effect, including 2018 Washington State Building Code, 2018 IBC as amended, including Chapter 11, "Accessibility."
2. U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disability Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities" including:
  - a. 2004 Americans with Disabilities Act Accessibility Guidelines (2004 ADAAG).
  - b. 2010 ADA Standards for Accessible Design (2010 ADAS).
  - c. For purposes of the Work and references included in Sections contained in the Project Manual, handicapped accessibility requirements are further defined to include the Code of Federal Regulations 28 CFR Part 36, 2004 ADAAG, and 2010 ADA Standards for Accessible Design. Where requirements differ or are in conflict, requirements of 28 CFR 36 prevail.
3. Accessible and Usable Buildings and Facilities 2009 of Washington, including 2009 ICC/ANSI A117.1 "Standard on Accessible and Usable Buildings and Facilities."

#### 1.4 REGULATORY AND GOVERNMENTAL CODES AND STANDARDS

- A. Applicability: Not all codes and standards may be indicated in Contract Documents. Applicable regulatory and governmental codes and standards, whether or not indicated, shall have the same force and effect as if bound or copied directly into the Contract Documents.
  1. Codes and standards include handicapped accessibility provisions of the codes and standards in effect and federal agencies and statutes.
  2. Codes and standards include green building standard code provisions affecting selection, procurement, storing, handling, installing, curing, cleaning and other aspects of the Work.
  3. Requirements in individual Sections may also indicate portions of the Work under the jurisdiction of regulatory entities and organizations, institutes, councils, societies, commissions, and associations responsible for the creation and publication of standards and regulations not necessarily under the jurisdiction of regulatory entities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 41 13.42

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Codes"; "Codes and Standards in Effect": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- C. "Directed": A command or instruction by Owner or Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Codes and standards in effect.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Not Less Than": The least quantity, quality, feature, or characteristic of each.
- I. "Provide": Furnish and install, complete and ready for the intended use.
- J. "Project Site": Space available for performing construction activities. The extent of Project site is not shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.
- K. "Reviewed": When used to convey Architect's action on Contractor's submittals, applications, and requests, "reviewed" or "reviewed with comments" is limited to Architect's duties and responsibilities as stated in the Conditions and Supplementary Conditions of the Contract and the Articles of Agreement.
- L. "Shall": Has a duty to.
- M. "Standard": Codes and standard in effect; conventions, established principles, and rules within the construction industry or as contained in codes that control performance of the Work.

### 1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with industry standards in effect as of date of the Contract Documents unless otherwise indicated.
  - 1. For industry standards referenced by applicable building codes, comply with dates listed in building codes unless otherwise indicated in Contract Documents.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
  - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

### 1.4 CODES AND STANDARDS IN EFFECT

- A. Applicability of Codes and Standards: Unless the Contract Documents include more stringent requirements, applicable codes and standards in effect at the federal, state, and in the locale in which the Project is location shall have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such codes and standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with codes and standards in effect as of date of the Contract Documents unless otherwise indicated.
  - 1. For standards referenced by applicable building codes, comply with dates listed in building codes unless otherwise indicated in Contract Documents.

### 1.5 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Specifications and Drawings up to date as of the date of the Contract Documents.
- C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Specifications and Drawings up to date as of the date of the Contract Documents.
- D. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities of the codes and standards in effect up to date as of the date of the Contract Documents.
- E. Codes and Standards: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the codes and standards in effect up to date as of the date of the Contract Documents.

Macy's Inc. Macy's - Interior Alterations

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00



## SECTION 01 50 23 - TEMPORARY FACILITIES AND CONTROLS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Requirements for temporary facilities and controls.

#### 1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect and authorities having jurisdiction including the following; where requirements conflict, comply with the most stringent provisions.
  - 1. Division 01 Section "Codes and Standards."
  - 2. Code of Federal Regulations (CFR) including:
    - a. CFR Title 29, Part 1910 "Occupational Safety and Health Standards."
    - b. CFR Title 29, Part 1926 "Safety and Health Regulations for Construction."
  - 3. Other Standards: Comply with additional standards indicated. Refer to individual publishers or sources of standards for original documents, including National Electrical Contractors' Association (NECA), National Electrical Manufacturer's Association (NEMA), National Fire Protection Association (NFPA), and Underwriters Laboratories (UL).

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Design, provide, maintain, and secure adequate and safe temporary facilities and controls suited to conditions and intended uses for durations required to facilitate the Work.
  - 1. The Articles of Agreement and the General and Supplementary Conditions of the Contract contain additional requirements for temporary facilities and controls.
- B. Safety: Contractor remains solely responsible for jobsite safety.
- C. Equivalent Facilities and Controls: Alternate and equivalent temporary facilities and controls may be provided at the Contractor's discretion where acceptable to Owner.

#### 1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, UL standards and NFPA 70 for electrical service temporary facilities and controls.
- B. Tests and Inspections: Have temporary facilities and controls tested and inspected where required. Arrange for and obtain required certifications and permits.

- C. Accessible Temporary Egress: Comply with applicable provisions in codes and standards in effect, the United States Access Board's ADA-ABA Accessibility Guidelines, and ICC/ANSI A117.1.

## 1.6 PROJECT CONDITIONS

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

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Provide new materials unless otherwise indicated. Undamaged, previously used materials in serviceable condition may be used if approved by Owner and only if used in temporary installations. Provide materials suitable for use intended.
- B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less in accordance with ASTM E84 and passing NFPA 701 Test Method 2.
- C. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.

### 2.2 TEMPORARY SUPPORT FACILITIES

- A. Support Facilities: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading and to resist wind forces if located outside Project walls.
  - 1. Provide fire extinguishers in each temporary office or unit in accordance with codes in effect.
  - 2. Store combustible materials apart from building.

### 2.3 EQUIPMENT

- A. General: Provide equipment suitable for use intended, undamaged, new or previously used if not part of permanent construction, and appropriate to the condition, use, and application.
- B. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- C. Permanent HVAC System: Owner authorizes use of permanent HVAC system for temporary use during construction. Provide filters with MERV of 8 at each return-air grille or open end of ductwork in system and remove at end of the Work.
  - 1. Where dirt and dust from the Work are found in system components, clean HVAC system as required in Division 01 Section "Closeout Procedures."
  - 2. Where supplemental heating, cooling, or dehumidification is required, provide vented, self-contained equipment listed and labeled with individual space thermostatic control, marked for intended location and application.
- D. Electric Equipment, Devices, and Accessories: Listed and labeled by UL and as defined in NFPA 70 and marked for intended use and application.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine conditions, with Installers present, for compliance with requirements and other conditions affecting progress or completion of the Work.
- B. Proceeding: Proceed with preparations only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 INSTALLATION, GENERAL

- A. General: Locate facilities and controls where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  - 1. Provide each facility and control ready for use when needed to avoid delay. Do not remove until facilities and controls are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.

### 3.4 INTERRUPTIONS TO UTILITIES

- A. General: Plan all interruptions to services in coordination with the General Contractor, so as to minimize inconvenience and outages for ongoing operations.
- B. Accidental Interruptions: Protect against accidental interruptions of service. Institute immediate emergency efforts to restore services when interrupted; efforts are the sole expense of the Contractor.

### 3.5 SUPPORT FACILITIES INSTALLATION

- A. Construction Limits: Confine material storage, staging, deliveries, and other operations within the construction limits of staging and construction areas.
- B. Traffic Controls: Maintain access for fire-fighting and emergency equipment and access to fire hydrants. Protect existing site curbs, inlets, pavement, and utilities.
- C. Storage and Staging: Use designated areas of Project site for storage and staging needs.
- D. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- E. Personnel Access: Limit construction personnel to enter and exit Project building at designated points.
- F. Construction Aids: Provide and maintain temporary construction aids necessary for the performance of the Work, and as required by authorities having jurisdiction.

- G. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
  - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- H. Food: Restrict eating to areas designated by General Contractor. Contain waste to trash containers in eating area.
- I. Sanitary Facilities: Use of Owner's existing restroom facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

### 3.6 PROTECTION FACILITIES AND CONTROLS INSTALLATION

- A. Protection of Existing Facilities: Protect existing equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
  - 1. Sand, finish, and paint surfaces of facilities and controls exposed to public view or within reach or touch by public.
- B. Barricades, Warning Signs, and Lights: Comply with requirements of codes and standards in effect and authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting. Provide covered overhead walkway protection for safe passage where required.
- C. Temporary Egress: Provide and maintain temporary egress from existing occupied facilities as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.
- D. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from other construction operations, and similar activities.
- E. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust containment devices.

### 3.7 SECURITY FACILITIES AND CONTROLS INSTALLATION

- A. Theft and Security: Secure materials and work in progress against unauthorized entry, vandalism, theft, or other damage or loss. Comply with NFPA 241.
  - 1. Contractor is responsible to secure its work against loss or damage for the duration of the Work.
  - 2. All construction personnel shall conform to the Contractor and Owner's security and loss provisions.
  - 3. Secure completed and partially-completed areas of construction. Prevent unauthorized entrance, vandalism, theft, and similar violations of security.

### 3.8 ACCESSIBILITY

- A. General: Provide temporary facilities and controls to comply with the most stringent accessibility codes and standards in effect.
  - 1. Provide and maintain accessible access for the public to occupied spaces and areas, including temporary ramps, transitions, and other means of compliance.

### 3.9 TEMPORARY FIRE PROTECTION

- A. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
  - 1. Provide portable hand carried, UL rated fire extinguishers according to NFPA 10 in all areas where work is performed. Locate fire extinguishers where convenient and effective for their intended purpose.
    - a. Do not rely upon Owner's fire extinguishers for protection.
  - 2. Maintain existing water-based fire sprinkler system in operation to protect the facility unless service interruption is required to perform or permit the Work.
    - a. Institute procedures including notification of Owner and fire department in the locale for activities where continuous fire protection service is temporarily interrupted.
    - b. Take only that portion of the facility that requires work to be performed out of service. Systematically remove and place system back in service.
    - c. Restore service at the end of each workday. Do not permit portions of the facility to remain unprotected when unsupervised.
    - d. Maintain written logs of service interruptions including times and parties involved.
    - e. Where required, institute fire watches.
  - 3. Prohibit smoking in construction areas. Supervise welding and other sources of fire ignition.
  - 4. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Instruct personnel in methods and procedures. Post warnings and information.

### 3.10 TEMPORARY HEATING, COOLING, VENTILATION AND DEHUMIDIFICATION

- A. Temporary Heating, Cooling, Ventilation and Dehumidification: Provide temporary heating, cooling, ventilation and dehumidification required by construction activities for curing or drying of completed installations or for protecting installed construction.
  - 1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.
- B. Covers: Provide and maintain protective enclosures or covers to protect open equipment, and filters at open ductwork.

### 3.11 TEMPORARY ELECTRICAL FACILITIES AND CONTROLS

- A. General: Provide extensions for temporary power. Comply with NECA "Temporary Electrical Facilities," NEMA, NFPA 241, and UL.
  - 1. Provide electric extensions and distribution of sufficient size, capacity, and power characteristics required for the Work coordinated with work outside of individual phases or construction limits.
  - 2. Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- B. Temporary Electrical Receptacles: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light; complying with OSHA, NFPA 70, and codes and standards in effect.
  - 1. Do not exceed safe length-voltage ratio for temporary circuits.
- C. Temporary High-Voltage Electrical Outlets: Properly configured, NEMA-polarized outlets.

- D. Uninterrupted Service: Avoid unplanned interruption to occupied portions of the building. Supplement existing electrical equipment and distribution, including temporary electrical equipment for continued electrical and lighting systems operation, whether or not indicated in Drawings.
  - 1. Maintain service by providing permanent wiring as soon as feasible. Re-feed existing equipment, devices, outlets, receptacles, lighting, emergency illumination, and receptacles to remain permanently.
  - 2. Permanently relocate electrical equipment and distribution as required; relocations are not indicated in Drawings. Remove and replace loads and circuits in a systematic manner. Shift loads using temporary load centers, panels, distribution, circuits, and other suitable equipment.
  - 3. Temporarily relocate existing or new electrical equipment and distribution as required; relocations are not indicated in Drawings. Remove and replace loads and circuits in a systematic manner.
  - 4. Do not exceed safe length-voltage ratio for circuits.
  - 5. Authorities having jurisdiction may impose restrictions on conditional use of electrical power during the Work. Work is conditional upon and subject to conditions imposed by the authorities having jurisdiction:
- E. Protection of Equipment: Protect electrical distribution, panels, switchgear, electrical equipment or devices, runs, conductors, duct banks and similar items whether temporary or permanent.
- F. Existing Electrical Circuitry, General: Investigate existing electrical distribution, panels, circuits, and wiring. Identify active circuits and wiring to remain inside and outside of work areas or phases. Identify distribution, circuits and wiring to be removed.
  - 1. Disconnect and remove wiring that will become inactive. Do not abandon in place.
  - 2. Remove circuitry to equipment and devices being removed or relocated; remove circuits back to the source panel unless locally terminated or unless otherwise indicated. Maintain portions of circuits required to provide power to other equipment and devices to remain.
    - a. Should the same feeder or circuit supply other equipment, fixtures, or devices to remain, provide wiring to maintain that equipment and those fixtures, or devices in service. Remove unused portions of feeders or circuits to nearest or new junction box.
  - 3. Where circuitry, cabling, conductors, boxes, or enclosures requiring access are covered or blocked by construction, relocate and alter items to provide required access. Avoid using access panels.
  - 4. Remove all electrical distribution, circuits, conduits, conductors, boxes, hangers and accessories no longer used prior to completion of ceilings. Do not abandon any electrical means above ceilings.
  - 5. Install cover plates on all energized receptacles and outlets and energized boxes or equipment.
  - 6. Properly install and connect grounding wiring and circuitry.
  - 7. Only circuits needed for the Work are to be energized.
  - 8. Protect circuits used for temporary means and methods with temporary or permanent ground-fault circuit interrupters (GFCI).
- G. Supports: Install temporary support or re-support wall- or overhead- mounted electrical panels, disconnects, controls, other components, devices, equipment, boxes, and related electrical items. Use slotted channel systems or other means to anchor and support work.

### 3.12 TEMPORARY LIGHTING FACILITIES AND CONTROLS

- A. Temporary Lighting: Provide and maintain temporary lighting of intensity and quality sufficient for proper and safe performance of the Work, and to comply with codes and standards in effect.
  - 1. Provide lighting to produce minimum illumination intensities required by OSHA and CFR 1910 and CFR 1926, and as required for the specific construction operation, but not less than 10 fc/sq. ft. (108 lx/0.10 sq. m) for general construction area lighting, whichever is greater.
    - a. Light all floor work areas, means of egress, and exit discharge points with temporary lighting until permanent lighting is installed.
    - b. Select method of temporary lighting, electrical distribution, and conductors to comply with NFPA 70 NEC.

- c. Provide not less than 30 fc/sq. ft. (323 lx/0.01 sq. m) for finishing operations.

### 3.13 TEMPORARY TELEPHONE AND DATA/COMMUNICATIONS SERVICES

- A. Existing System: Maintain existing telephone and data/communications service and distribution system. Investigate existing wiring and cabling to identify active circuitry to remain within work areas and beyond. Where required, install and connect temporary telephone and data/communications services to reroute or re-feed system.
  - 1. Disconnect and remove or relocate wiring and cabling that will become inactive by the work.
  - 2. Remove circuitry to equipment and devices being removed or relocated; remove circuits back to the source equipment unless otherwise indicated. Maintain portions of circuits required to provide data and communications to other equipment and devices to remain.

### 3.14 VERTICAL TRANSPORTATION FACILITIES AND CONTROLS

- A. Freight Elevator: Use of Owner's freight elevator is permitted when elevator is operational. Do not exceed elevator's rated load capacity. Erect and maintain protections for elevator cab, door, and frame.
  - 1. Replace or repair any items damaged during construction.
  - 2. When freight elevator is not in service, use means and methods necessary to transport and delivery products for the continued, uninterrupted progress of the Work.
  - 3. At Preliminary Acceptance/Substantial Completion, restore freight elevator to condition before initial use, less wear acceptable to Owner.
- B. Other Vertical Transportation: Do not use passenger elevator or escalators for construction at any time.

### 3.15 WASTE COLLECTION FACILITIES AND CONTROLS

- A. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.
  - 1. Comply with progress cleaning requirements in Division 01 Section "Execution."
  - 2. Comply with Division 01 Section "Construction Waste Management and Disposal" for waste disposal and diversion.

### 3.16 OPERATION

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
  - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
  - 2. Maintain support facilities until Substantial Completion inspection is scheduled. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion unless agreed by Owner and Architect.

3.17 TERMINATION AND REMOVAL

- A. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion.

3.18 REPAIRS

- A. Repairs: At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements of Division 01 Section "Closeout Procedures."

3.19 PROTECTION

- A. General: Protect the Work to comply with codes and standards in effect and applicable provisions of the Contract, including General Conditions.
- B. Noise: Restrict use of noisemaking tools and equipment to hours that will minimize complaints.
- C. Loads: Do not load structure with weight that will endanger structure. Avoid concentrated loads.
- D. Finishes: Provide substantial protection for finish materials subject to damage.
- E. Glass: Protect glass against breakage.

END OF SECTION 01 50 23



## SECTION 01 60 00 - PRODUCT REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Administrative and procedural requirements for:
    - a. Selection of products for use in Project;
    - b. Product delivery, storage, and handling;
    - c. Manufacturers' standard warranties on products;
    - d. Special warranties; and
    - e. Comparable products.

#### 1.3 DEFINITIONS

- A. Products: New items obtained for incorporating into the Work. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
  - 2. Comparable Product: Product by named manufacturer that is demonstrated and reviewed through the comparable product submittal process described in Part 2 "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.
  - 1. Evaluation of Comparable Products: Product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.
  - 2. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.
- C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.

- D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:
  - 1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
  - 2. Data indicating compliance with the requirements specified in Part 2 "Comparable Products" Article.
- E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Division 01 Section "Submittal Procedures."
- F. Substitution: Refer to Division 01 Section "Substitution Procedures After Award" for definition and limitations on substitutions.

#### 1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
  - 1. Resolution of Compatibility Disputes between Multiple Contractors:
    - a. Contractors are responsible for providing products and construction methods compatible with products and construction methods of other contractors.
    - b. If a dispute arises between the multiple contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces.

#### 1.5 COORDINATION

- A. Coordination: Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

#### 1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. General: Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
  - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
  - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
  - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
  - 4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.
- C. Storage:
  - 1. Provide a secure location and enclosure at Project site for storage of materials and equipment.
  - 2. Store products to allow for inspection and measurement of quantity or counting of units.

3. Store materials in a manner that will not endanger Project structure.
4. Store products to avoid damage or deterioration.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and water- and weather- protection requirements for storage.
6. Protect stored liquids from freezing or excessive temperatures or humidity.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

## 1.7 PRODUCT WARRANTIES

- A. General: Warranties specified in other Sections shall not deprive Owner of other rights Owner may have under prevailing laws and other provisions of Contract Documents.
  1. Nothing contained in this Section or the Contract Documents shall establish a period of limitation with respect to other obligations the Contractor has under the Contract and prevailing laws.
- B. Warranties: Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
  1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
  2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.
- C. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
  1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
  2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
  3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- D. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

## PART 2 - PRODUCTS

### 2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
  1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
  3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
  4. Where products are accompanied by the term "as selected," Architect will make selection.
  5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

6. Or Equal: For products specified by name and accompanied by the term "or equal," "or comparable equal," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
  - a. Submit additional documentation required by Architect in order to establish equivalency of proposed products. Unless otherwise indicated, evaluation of comparable or "or equal" product status is by the Architect, whose determination is final.

B. Product Selection Procedures:

1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
  - a. Sole product may be indicated by the phrase "Subject to compliance with requirements, provide the following."
2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
  - a. Sole manufacturer/source may be indicated by the phrase "Subject to compliance with requirements, provide products by the following."
3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Substitutions for Contractor's convenience may or may not be considered.
  - a. Limited list of products may be indicated by the phrase "Subject to compliance with requirements, provide one of the following."
  - b. Where "No substitutions permitted" is indicated, comparable products or substitutions for Contractor's convenience will not be considered.
4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements. Substitutions for Contractor's convenience may or may not be considered.
  - a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience may or may not be considered.
  - a. Limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, provide products by one of the following."
  - b. Where "No substitutions permitted" is indicated, comparable products or substitutions for Contractor's convenience will not be considered.
6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed or a product by an unnamed manufacturer that complies with requirements.
  - a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."
  - b. Substitutions for Contractor's convenience may or may not be considered.
7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
8. Comply with requirements in Division 01 Section "Substitution Procedures" for substitutions for convenience. Owner's and Architect's decision on whether a proposed substitution is accepted is final.

- a. Where "No substitutions permitted" is indicated, comparable products or substitutions for Contractor's convenience will not be considered.
- C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
  1. Additional work required to achieve acceptable match shall be without changes to Contract Sum or Contract Time (Contract Duration).
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.
  1. Range: If the phrase "range of colors, patterns, or textures" or similar phrase does not differentiate between Standard and Full, provide selections from manufacturer's fullest range of product choices, regardless of cost, including premium or optional items.

## 2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:
  1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
  2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes such as suitability, adaptability, type, kind, and function, in-service performance including durability and anticipated service life, physical properties including weight, dimension, and structural capacity, visual characteristics including visual effect and match, and other specific features and requirements.
  3. Evidence that proposed product provides specified warranty.
  4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
  5. Samples, if requested.
- B. Architect's Action on Comparable Products Submittal: If necessary, Architect will request additional information or documentation for evaluation, as specified in Section 013300 "Submittal Procedures."
  1. Form of Review of Submittal: As specified in Division 01 Section "Submittal Procedures After Award."
  2. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- C. Submittal Requirements, Two-Step Process: Approval by the Architect of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

## PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 64 00 - OWNER-FURNISHED MATERIALS, EQUIPMENT, AND FURNISHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION

- A. Section Includes:
  1. Owner-furnished materials, equipment, and furnishings.
  2. Receiving, unloading, hoisting, handling, and storage of Owner-furnished materials, equipment, and furnishings.
  3. Unpacking, uncrating, and removal of packaging materials, and disposal of related waste materials.
  4. Material quantity estimation and accounting for Owner-furnished materials, equipment, and furnishings during the Work, including confirmation of and aid to Owner in ordering of materials, equipment, and furnishings.
  5. Inventory of bills of lading and comparison with Owner's ordering documentation at time of delivery.
  6. Installation of Owner-furnished materials, equipment, and furnishings.

1.3 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Scheduling: Owner has negotiated or will within the course of the Work negotiate orders with suppliers of materials, equipment, and furnishings to be incorporated into the Work. Within 10 days after receiving the notice to proceed, the Contractor shall establish installation and shipping schedules directly with the Owner's Representative and its suppliers. Immediately notify the Owner of any delays resulting from delivery schedules.
  1. Time and expedite all deliveries to ensure suppliers meet all agreed upon dates and immediately notify the Owner of any anticipated delays.
  2. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
  3. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
- B. Delivery Costs: Owner in ordering items listed under Part 2 of this Section will purchase and deliver products F. O. B to the Project site.

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED MATERIALS, EQUIPMENT, AND FURNISHINGS

- A. Owner-Furnished Materials, Equipment, and Furniture includes, but is not limited to, the following:

ID

- A = Furnished by Owner, Installed by Contractor
- B = Furnished and Installed by Owner/Owner's Separate Forces
- C = Furnished by Contractor, Installed by Owner's Separate Forces

B. Description:	ID:
1. Porcelain Tile, Flooring, Materials Only .....	A
2. Modular Carpeting, Materials Only .....	A
3. Interior Wayfinding Signage, Materials Only.....	A
4. Packing Tables, Materials Only, Unassembled .....	A
5. Equipment Cabinet, Materials Only, Unassembled (Rough-in, Conduit, Line .....	A
Voltage and Line Voltage Connections, Plug Mold, Other Electrical by Contractor. Refer Electrical Drawings and Division 26 Sections)	
6. Desks, Unassembled (Rough-in, Conduit, Boxes, Line Voltage and Line .....	A
Voltage Connections by Contractor. Refer Electrical Drawings and Division 26 Sections)	
7. Monitors/Large Screen Televisions ((Rough-in, Conduit, Boxes, Line Voltage....	A
and Line Voltage Connections by Contractor. Refer Electrical Drawings and Division 26 Sections)	
8. Fixed Merchandise Shelving Systems .....	B
9. Fixed Invoice Shelving Systems .....	B
10. Fixed IPC Shelving Systems.....	B
11. Fixed Supply Systems.....	B
12. Loose Wood Fixtures .....	B
13. Loose Metal Fixtures .....	B
14. Cash Wraps (Rough-in, Conduit, Boxes, Line Voltage and Line Voltage .....	B
Connections by Contactor. Refer Electrical Drawings and Division 26 Sections)	
15. Point-Of-Sale (POS) System-Low-Voltage Distribution and Equipment .....	B
(Rough-in, Conduit, Boxes and Line-Voltage by Contractor. Refer Electrical Drawings and Division 26 Sections)	
16. VOIP System - Low-Voltage Distribution, Equipment and Devices .....	B
(Rough-in, Conduit, and Boxes by Contractor. Refer Electrical Documents.)	
17. Communications and Data, IDF Systems, Equipment and Devices (Rough-in, ....	B
Conduit, Boxes and Line Voltage by Contractor. Refer Electrical Drawings and Division 26 Sections)	
18. Articles of Surveillance -Low-Voltage Distribution, Equipment and Devices.....	B
(Rough-in, Conduit, Boxes and Line Voltage by Contractor. Refer Electrical Drawings and Division 26 Sections)	
19. Door Lock Cylinders (Refer Division 08 Section "Door Hardware-Descriptive ...	C
Specification.)	

PART 3 - EXECUTION

3.1 GENERAL

- A. General: Owner will purchase and make arrangements for delivery to the site the items listed under Part 2 of this Section as Owner-Furnished Materials, Equipment and Furnishings, which are to be expedited, received and installed by the Contractor in accordance with Part 3 of this Section.

### 3.2 RECEIVING

- A. Delivery: Handle delivered products using means and methods that will prevent damage, deterioration and loss, including theft and vandalism. Comply with manufacturers written instructions.
  - 1. Include all costs for receiving, handling, storage as required, inventory, accounting for materials, and installation or reinstallation in Contract Sum and Contract Time.
  - 2. Furnish adequate personnel, tools, and equipment to promptly unload materials, equipment, and furnishings in accordance with instructions from carrier or supplier.
  - 3. Promptly unload delivered materials, equipment, or furnishings.
- B. Inspection and Inventory Upon Delivery: Inspect products upon delivery to compare with Owner's order documentation and to determine that products are complete and undamaged.

### 3.3 STORAGE

- A. General: Store equipment, materials, and furnishings received prior to the time for incorporation in the Work.
- B. Moving and Relocation: Avoid unnecessary handling of equipment, materials, and furnishings beyond initial receipt. Plan construction staging and sequencing to minimize relocating items.
- C. Protections: Protect products from damage or deterioration. Protect from water or fire, or theft.

### 3.4 INSTALLATION

- A. General: Unpack, verify parts and instructions, assemble, and install Owner-furnished materials, equipment, and furnishings in accordance with the manufacturers or supplier's written instructions and provisions of the Contract Documents.
- B. Accessory Items: Provide all materials and other accessory and supplementary items necessary for installation and fully functional operation, if not furnished with equipment.
  - 1. For fixed elements, provide anchorage and other accessories necessary for installation.
- C. Warranties: Install Owner-furnished materials, equipment, and furnishings in a manner consistent with manufacturer's requirements for general and special Project warranties.

END OF SECTION 01 64 00



SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. General administrative and procedural requirements governing execution of the Work.

1.3 PREINSTALLATION MEETINGS

- A. Cutting and Patching Conference: Where necessary, before proceeding, meet at Project site with parties and trades involved in cutting and patching. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.4 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
  - 1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, investigate and identify locations and details of cutting using appropriate means and methods before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
    - a. Structure includes but is not limited to elevated above ground structure, hangers, supporting members, and similar structural members receiving loads and other gravity-, force- and load-carrying assemblies, components, connections, and members.
  - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
    - a. Primary operational systems and equipment.
    - b. Fire separation assemblies.
    - c. Air or smoke barriers.
    - d. Fire-suppression systems.
    - e. Plumbing piping systems.
    - f. Mechanical systems piping and ductwork.
    - g. Control systems.
    - h. Communication systems.
    - i. Fire-detection and -alarm systems.
    - j. Conveying systems.
    - k. Electrical wiring systems.
    - l. Operating systems of special construction.
    - m. Equipment and operating systems supports.

- n. Noise- and vibration-control elements and systems.
  - 3. Passive Barrier and Other Construction Elements: Do not cut and patch passive barrier elements, assemblies, or systems and related components in a manner that reduces their performance or serviceability or which otherwise affect their ability to perform or act as designed.
    - a. Components of or within the overall building envelope.
    - b. Water and air barriers, vapor retarders, and other water, moisture, air, or vapor barriers, membranes, retarders, and flashings.
    - c. Fire separations, fire barriers, firewalls, smoke barriers, and similar assemblies.
    - d. Penetration and joint firestopping systems.
    - e. Sprayed fire-resistive material, if present.
    - f. Other passive elements, assemblies, or systems.
  - 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

## 1.5 PROJECT CONDITIONS

- A. Safety: Contractor remains solely responsible for jobsite safety. Neither activities nor presence of the Owner or Architect at the Project site or an off-site at a facility in connection with the Work shall relieve the Contractor of its obligations for safety.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.
- C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
  - 1. Use cleaning products that comply with maximum allowable VOC levels in effect.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Conditions: Before beginning work, investigate and verify the existence and location of external or internal, buried, concealed, partially concealed or exposed utilities, building systems, building automation and other control systems, communications, other systems, and other construction affecting the Work.

1. Investigate, identify, and record conditions, routing, use, application, or other characteristics of each system or component disturbed or potentially disturbed in performance of the Work.
  2. Investigate, identify, and record conditions.
  3. Furnish location data for work related to Project that must be performed by others.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Commencement: Commencement of the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
1. Verify vertical and horizontal lines and elevations, points of attachment, bearings, anchor locations, and other characteristics to receive the Work.
  2. Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating work without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Allow for trimming and fitting.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect in accordance with Division 01 requirements.

### 3.3 CONSTRUCTION LAYOUT

- A. General: Before proceeding to lay out the Work, verify layout information shown on Drawings. Lay out the Work using accepted practices, including setting datums, benchmarks, control points, elevations, vertical and horizontal control measures, and other surveying practices. Where required, perform construction layout using licensed civil surveyor.
1. Establish benchmarks and control points to set lines and levels as needed to locate each element of Project.
  2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
  3. Inform installers of lines and levels to which they must comply.
  4. Check the location, level and plumb, of every major element as the Work progresses.
  5. If discrepancies are discovered, notify Owner and Architect promptly.

6. Notify Owner and Architect when deviations from required lines and levels exceed allowable tolerances.

B. Building Lines and Levels: Locate and lay out control lines and levels including column lines and floor elevations. Transfer markings and elevations for use with control lines and levels. Level the Work from two or more locations.

C. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Make the log available for reference by Owner.

### 3.4 FIELD ENGINEERING

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

1. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

### 3.5 INSTALLATION

A. General: In addition to requirements of individual Sections, locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work true to line and plumb, and make horizontal work true to line and level.

2. Comply with additional tolerances indicated in individual Sections.

3. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

4. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

5. Hold systems tight to underside of floor or roof structure except for gravity flow systems. Transition elevation of conduits, conduit banks, enclosures, pull boxes, bends, piping, conductors, ductwork, and similar items at varying depths of structural framing. Do not install systems to a single horizontal elevation at a single point below lowest structural member of floor or roof.

6. Hold wet- and dry -type fire protection piping mains and branches at proper horizontal elevations; hold piping to structure and where required, transition piping for optimal routing and to maintain drainage without entrapping water.

7. Conceal pipes, ducts, conduits, wiring, cabling, conductors, and similar items in finished areas.

8. Maintain minimum headroom clearances of not less than 96 inches (2440 mm) in finished occupied spaces including back-of-house areas.

B. Manufacturer's Instructions: In addition to specific requirements of individual Sections, comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

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

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

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

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

1. Maintain means to contain oils and chemicals and to prevent spills and intentional and unintentional discharge.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
  1. Deliver such items to Project site in time for installation.
- H. Attachment: Provide blocking, attachment plates, and anchors and fasteners of adequate size and number to securely anchor each component in place and resist loads and forces, including lateral forces, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.
  1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  2. Accessible Mounting Heights and Clearances: Install within ranges at mounting heights and clearances or other mounting locations indicated in codes and standards in effect.
  3. Allow for building movement, including thermal expansion and contraction.
  4. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.
- J. Materials: Use and install products and materials, cleaners and accessories that are not hazardous or produce dangerous fumes, vapors, or residue that is hazardous.

### 3.6 CUTTING AND PATCHING

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  1. Cutting and patching includes removal and replacement of materials outside its normal trade operations.
  2. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
  3. Uncover portions of the Work to provide for installation of his work.
  4. Make routine penetrations of non-structural surfaces for installation of piping, conduit, cabling, hangers, and similar items.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of Work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Division 01 Sections.

- F. Building Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
  
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - 1. Include all cutting and coring required to perform the work.
  - 2. Begin cutting only after identifying depths and locations of internal reinforcing, other elements, and other embedments.
  - 3. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 4. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 5. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 6. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 7. Elevated Concrete Structure: Cut or core openings required for the work. For openings, remove in small sections; use power-driven saw to cut openings. Leave clean edges true to line.
    - a. Layout and cut or core existing elevated concrete structure only after locating internal reinforcing, elements, connections, embedments, and other internal features.
    - b. Use imaging or scanning employing appropriate detection equipment and technologies, tools, and services to identify locations, depths, extent, and other characteristics of elevated structure.
    - c. Locate cores, holes, and openings to avoid cutting reinforcing, elements, connections, embedments, and other internal features of structure.
      - 1) Adjust layout and the work as required to accommodate final position of cores, holes and openings.
      - 2) Comply with additional requirements indicated in Drawings and individual Sections.
    - d. In general, use hand or small power tools designed for sawing and grinding to produce cut edges, not hammering and chopping. Do not use breaking or chipping solely to cut openings.
    - e. Cut or core holes and openings neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
    - f. Make cuts as close as practicable to edges to remain.
    - g. Limit size of coring to 8 inches (200 mm) or less, or where required, to smaller size necessary to fit between internal elements.
    - h. Limit size of coring to fit between reinforcing or other elements.
    - i. Avoid coring multiple holes without sufficient concrete between holes. Provide not less than 12 inches (300 mm) of concrete between edges of adjoining cores unless otherwise specifically indicated or required by conditions.
  - 8. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
    - a. For electrical circuits, unless otherwise indicated, for circuits no longer used, remove wiring and conduit to source panelboard or load center. Comply with additional requirements of individual Sections.
  - 9. Proceed with patching after construction operations requiring cutting are complete.
  
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.
  - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
    - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    - b. Restore damaged pipe covering to its original condition.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.
    - b. Patch, repair, or rehang in-place construction as necessary to provide an even-plane surface of uniform appearance.
    - c. Comply with additional requirements of individual Sections.
  4. Ceilings: Patch, repair, or rehang in-place ceilings, bulkheads, and soffits as necessary to provide an even-plane surface of uniform appearance.
    - a. Comply with additional requirements of individual Sections.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

### 3.7 COORDINATION OF OWNER'S PORTION OF THE WORK

- A. Site Access: Provide access to Project site for Owner's separate forces.
- B. Coordination: In addition to requirements of Division 01 Sections, coordinate construction and operations of the Work with work performed by Owner's separate forces.
1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
  2. Preinstallation Conferences: Where required or appropriate, include Owner's construction forces at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's separate forces if portions of the Work depend on Owner's construction.

### 3.8 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with additional requirements of 29 CFR 1926.
  2. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  3. Do not hold waste materials more than seven days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).
  4. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
    - a. Use containers intended for holding waste materials of type to be stored.
  5. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Preliminary Acceptance/Substantial Completion.
- G. Waste Disposal: Do not wash waste materials down sinks, sewers, or into waterways. Comply with waste disposal requirements in Division 01 Sections.
- H. In Progress Work: During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Preliminary Acceptance/Substantial Completion.
- I. Completed Clean completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.9 STARTING AND ADJUSTING

- A. General: Coordinate startup and adjusting of equipment and operating components with requirements in individual Sections.
- B. Startup: Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjusting: Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Testing: Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
  - 1. Use calibrated instruments to test and make adjustments to complex operating equipment. Calibrate test equipment in accordance with manufacturer's calibration procedures prior to testing.
- E. Manufacturer's Field Service: Engage factory-trained and factory-authorized manufacturer's field services where required or as indicated in individual Sections.



3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. General: Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Temperature and Humidity: Comply with manufacturer's written instructions for temperature and relative humidity.

3.11 CORRECTION OF THE WORK

- A. General: Repair or remove and replace damaged, defective, or nonconforming Work. Restore damaged substrates and finishes.
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Repairs: Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.
- C. Permanent Facilities: Restore permanent facilities used during construction to their specified condition.
- D. Damaged Surfaces: Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- E. Operating Equipment: Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

END OF SECTION 01 73 00

SECTION 01 74 19.42 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:
  - 1. Administrative and procedural requirements for diverting or disposing of nonhazardous construction and demolition (C&D) waste.

1.3 DEFINITIONS

- A. Construction and Demolition (C&D) Waste: Non-hazardous solid waste resulting from construction, demolition, alterations, or repair operations. Construction waste includes packaging.
  - 1. Hazardous materials of any kind are handled and disposed of separately from this Contract.
- B. Disposal: Removal of construction and demolition waste and deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- C. Diversion: Removal of construction and demolition waste and recovery and for subsequent processing in preparation for subsequent salvage, sale, donation, recycling, or reuse.
- D. Universal Waste: As defined by regulations, codes and standards in effect.

1.4 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect, including:
  - 1. Division 01 Section "Codes and Standards."
  - 2. State of Washington universal waste rules including WAC 173-303-573.
  - 3. Other Standards: Comply with additional standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM) and National Fire Protection Association (NFPA).

1.5 PERFORMANCE REQUIREMENTS

- A. Minimum Diversion Rate: Achieve end-of-Project rates for diversion, including salvage and recycling, of not less than 70 percent by weight of total nonhazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials
  - 1. Construction and demolition waste includes, but is not limited to:
    - a. Concrete.
    - b. Wood.

- c. Gypsum.
  - d. Metals.
  - e. Plastics.
  - f. Glass.
  - g. Rough hardware.
  - h. Metal doors and frames.
  - i. Metal studs and other metal framing.
  - j. Gypsum board.
  - k. Piping.
  - l. Supports and hangers, clevis and connectors.
  - m. Valves.
  - n. Mechanical and other equipment.
  - o. Metal ductwork, excluding any acoustical or thermal lining.
  - p. Electrical conduit.
  - q. Copper wiring.
  - r. Salvaged building items.
  - s. Other items able to be diverted from landfills and incinerators.
2. Packaging: Regardless of goal indicated, salvage or recycle 100 percent of the following uncontaminated packaging materials:
- a. Paper.
  - b. Cardboard.
  - c. Boxes.
  - d. Plastic sheet and film.
  - e. Polystyrene packaging.
  - f. Wood crates.
  - g. Wood pallets.
  - h. Plastic pails and buckets.

#### 1.6 MATERIALS OWNERSHIP

- A. General: Unless otherwise indicated, construction and demolition waste becomes property of Contractor.

#### 1.7 INFORMATIONAL SUBMITTALS

- A. Waste Management Plan: Work with Contractor and subcontractors for submittal of plan within 15 days of date established for commencement of the Work.
1. Submit to authorities having jurisdiction in Project locale where required.
  2. Submit to Owner.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit reports. Use forms agreeable to Owner. Include the following information:
1. Material category.
  2. Generation point of waste.
  3. Total quantity of waste in tons (tonnes).
  4. Quantity of waste salvaged, both estimated and actual in tons (tonnes).
  5. Quantity of waste recycled, both estimated and actual in tons (tonnes).
  6. Total quantity of waste recovered (salvaged plus recycled) in tons (tonnes).
  7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
  8. Submit to Owner.
- C. Waste Reduction Calculations: Before request for Preliminary Acceptance/Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
1. Submit to Owner.

- D. Records of Donations or Sales: Indicate receipt and acceptance of salvageable waste donated or sold to individuals and organizations. Indicate whether organization is tax exempt.
  - 1. Submit to Owner.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
  - 1. Submit to Owner.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
  - 1. Submit to Owner.

#### 1.8 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Experienced firm, or individual employed and assigned by General Contractor, with a record of successful waste management coordination of projects with similar requirements.
- B. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.
- C. Waste Disposal Firms: Hauler or disposal firm licensed and recognized by authorities having jurisdiction for legal and safe disposal of waste products.
- D. Universal Waste: Handle and dispose of universal waste in accordance with codes and standards in effect.
  - 1. Universal wastes include regulated batteries, lamps, and mercury containing equipment.

#### 1.9 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to requirements of ASTM E1609. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of construction and demolition waste generated by the Work. Use agreed upon form and format. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Use agreed upon form and format. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
  - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
  - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
  - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
  - 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
  - 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.

6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.
- D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there were no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Use agreed upon form and format. Include the following:
1. Total quantity of waste.
  2. Estimated cost of disposal (cost per unit). Include transportation and tipping fees and cost of collection containers and handling for each type of waste.
  3. Total cost of disposal (with no waste management).
  4. Revenue from salvaged materials.
  5. Revenue from recycled materials.
  6. Savings in transportation and tipping fees by donating materials.
  7. Savings in transportation and tipping fees that are avoided.
  8. Handling and transportation costs. Include cost of collection containers for each type of waste.
  9. Net additional cost or net savings from waste management plan.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
1. Comply with operation, termination, and removal requirements in Division 01 Section "Temporary Facilities and Controls."
  2. Comply with NFPA 241.
  3. Comply with universal waste regulations of locale in which Project is located.
  4. Pay any and all fees, assessments, costs, duties, and charges for legal disposal and diversion of waste.
- B. Waste Management Coordinator: If not employed by Contractors, engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
  2. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

### 3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:

1. Clean salvaged items.
2. Pack or crate items after cleaning.
3. Store items in a secure area until installation.
4. Protect items from damage during transport and storage.
5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Sale and Donation: Not permitted on Project site.

### 3.3 RECYCLING CONSTRUCTION AND DEMOLITION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

D. Procedures: Separate construction and demolition debris from general waste. Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved waste management plan.

1. Source separate wastes where possible. If source separation cannot be performed or site constraints prevent separation, commingle wastes according to requirements of waste management facility.

E. Universal Wastes: Comply with State of Washington WAC 173-303-573, Department of Ecology regulations, and codes and standards in effect.

1. In addition, comply with Department of Ecology Publication 21-04-017 Guide to Universal Waste.
2. Separate lamps by type and store according to requirements in 40 CFR 273 and universal waste requirements of WAC 173-303-573.
3. Do not crush lamps. Containerize lamps in structurally sound cardboard boxes, fiber drums, or other suitable container. Store containers closed to prevent lamp breakage.
4. Sort and segregate batteries to prevent reactions during storage and transport to recycler.
5. Treat thermostats, thermometers, barometers, tilt switches, manometers, and flame sensors as universal waste. Containerize and transport ampules in closed containers. Prevent breakage.
6. Clearly label and mark individual batteries, lamps, and mercury-containing equipment or containers into which universal wastes are placed. Use prescribed phrases for labeling individual wastes according to Publication 21-04-017.
7. Store universal wastes only so long as to dispatch them to approved destination facilities.

### 3.4 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged for reuse, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Do not allow waste materials that are to be disposed of to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

END OF SECTION 01 74 19.42

SECTION 01 76 00 - MOISTURE CONTROL DURING CONSTRUCTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Requirements and procedures for moisture control during construction.

1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect, including:
  - 1. Division 01 Section "Codes and Standards."

1.4 QUALITY ASSURANCE

- A. Manufacturer's Requirements and Recommendations: Comply with manufacturer's written instructions, requirements and recommendations for providing and maintaining Project conditions.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. General: Deliver, store, and handle products including equipment to prevent damage to products not designed to resist exposure, precipitation, water, groundwater, runoff, or excess humidity, and where such materials, if exposed, adversely affect or alter the products or harbor water or mold.
  - 1. Damage includes mold.
  - 2. Prevent exposure of any porous, semi-porous, hygroscopic, or other materials, or materials high in organic content, or those which are sensitive to excess moisture or humidity.
- B. Protections: Provide protections for products prior to permanent installation into the Project.
  - 1. On a daily basis, monitor protections and condition. Take actions necessary to protect vulnerable products.
  - 2. Wherever possible, store materials under cover, inside the building, or in properly ventilated storage containers suitable for the storage of materials and products indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Select products suitable and appropriate for condition.
  - 1. Comply with Division 01 Section "Temporary Facilities and Controls" for temporary provisions.
  - 2. Comply with individual Sections for products.



3. Comply with manufacturer's requirements regarding specific materials, conditions for storage and installation, and other provisions for moisture control.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. General: Examine the areas and conditions under which the Work is to be performed with Installers present to review conditions detrimental to storage, use, installation, or maintenance of products or partially completed portions of the Work.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

#### 3.2 MOISTURE CONTROLS

- A. General: Maintain building enclosure and protections from exposure. Avoid creating conditions where excess interior humidity exists. Maintain suitable temperatures for the Work within ranges recommended by product manufacturers. Avoid trapping water or excess moisture in the ongoing or finished Work. Take immediate action including where required, complete removal of affected work.
  1. Protect the Work from damage caused by brief or sustained precipitation, water infiltration or intrusion, exposure to elements, wetting, or accumulations of collected water or groundwater.
  2. Prevent standing water at interiors.
  3. Identify conditions that could allow the introduction of water or excess moisture or other conditions that could damage or delay construction, or that would allow exposure or damage to occur to uncompleted or completed construction.
  4. Remedy conditions in a timely manner to prevent mold growth or other detrimental conditions in ongoing or completed construction.
- B. Temporary Moisture Control Protections: Comply with additional requirements of Division 01 Section "Temporary Facilities and Controls."
- C. Monitoring: Monitor construction and partially completed areas for water intrusion, elevated moisture, condensation, excess water and humidity, and excess temperatures on a regular basis, not less than daily.
- D. Visual Indications of Damage: Indications that products are wet or moisture damaged includes, but are not limited to, discoloration, other changes, or irregular shape. Indications that products are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.
  1. For water-sensitive electrical or electronic equipment and devices, visual indications include, but are not limited to, wetness or evidence of wetting, evidence of mold, or other signs of change or damage.
  2. Remove and replace products that show evidence of damage or loss from excess moisture, exposure, weather, and wetting.

### 3.3 SPECIFIC MOISTURE CONTROLS

- A. Interior Gypsum Board: Install gypsum board at interior spaces only when building mechanical systems can maintain temperatures in enclosed areas and spaces below 80 deg F (26.7 deg C), above 50 deg F (10 deg C), and maintain constant relative humidity at or below 70 percent at temperatures below 80 deg F (26.7 deg C).
  - 1. Install gypsum board only when manufacturer's conditions for installation have been met.
  - 2. Avoid installing interior gypsum board where excess moisture, high humidity, stagnant air, and uncontrolled or standing water on floors are present.
  - 3. Provide ventilation to remove excess moisture from interior gypsum board finishing operations and to permit proper drying of compounds.
  - 4. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
  - 5. Comply with additional requirements of Division 09 Section "Gypsum Board."
- B. Interior Acoustical Ceiling Products:
  - 1. Install interior acoustical ceiling panel or tile products only when manufacturer's conditions for installation have been met.
  - 2. Avoid installing interior acoustical ceiling panel or tile products where excess moisture, high humidity, stagnant air, and uncontrolled or standing water on floors are present.
  - 3. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
  - 4. Comply with additional requirements of "Acoustical Panel Ceilings."
- C. Heating, Ventilation, and Air Conditioning and Other Equipment: Protect heating, ventilation, and air conditioning and other equipment to maintain in a clean and dry condition. Do not allow equipment or ductwork to become wet. If found wet or wetted, clean and dry, or replace if damaged.
  - 1. Do not operate equipment in which accumulations have become wet or where accumulations may be forced by air pressure into other areas of the Work.
  - 2. Replace filtration media immediately that has become wetted, and clean areas of infiltration including filtration racks. Install new, clean and dry filtration media.
- D. Electrical and Electronic Equipment and Devices: Maintain conditions for proper storage and installation according to manufacturer's written requirements and recommendations. Protect products including hygroscopic materials and moisture-sensitive devices (MSD) from excess moisture, exposure, weather, and wetting. Avoid exceeding component's Moisture Sensitivity Level (MSL).

### 3.4 HUMIDITY CONTROL

- A. Ventilation: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
  - 1. Ventilate construction naturally or with the aid of fans, exhaust equipment, or other active means to maintain air movement and optimal conditions conducive to proper construction.
  - 2. Use ventilation to maintain proper relative humidity.
    - a. Reduce relative humidity exceeding 70 percent within enclosed spaces or portions of construction where such excess humidity can potentially damage the Work.
  - 3. Provide dehumidification systems when required to reduce substrate moisture levels.
- B. Investigation of Source: Identify and correct source or condition leading to excess moisture, exposure, weather, and wetting.

- C. Clean Up: Commence clean up and drying operations immediately after initial infiltration or wetting.
- D. Cleaning and Drying: Clean and dry areas wetted within 48 hours of occurrence of water intrusion or other source of wetting.

### 3.5 REPAIRS

- A. Products: Promptly remove products damaged by excess moisture, exposure, weather, and wetting, improper storage, or other detrimental conditions.
  - 1. Damage includes, but is not limited to, water or other staining, dampness, wetness or wetting, saturation, mold, corrosion, rust, oxidation, tarnishing, changes in appearance, or other deterioration.
  - 2. Do not treat in-place products that are wet or previously wetted with topical coatings, shellac, preservatives, cleaners, or other treatments.
  - 3. Allow unaffected products to dry thoroughly, using ventilation or other means.
  - 4. Replace products only after the source of water intrusion or moisture are identified, all related areas cleaned and corrected, and conditions made water- and weather-tight.
- B. Repairs: Repair or replace products to comply with requirements of individual Sections and manufacturer's written instructions and recommendations.
  - 1. Remove damaged products at earliest point after identification and remedy of source.
- C. Performance and Appearance: Repair products only where repairs do not affect the products performance, durability, service life, function, finish, operation, or other characteristics. Replace where one or more of these are affected.
- D. Appearance: Restore exposed finishes to eliminate visual defects. Otherwise, replace product.

END OF SECTION 01 76 00

## SECTION 01 77 00 - CLOSEOUT PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes;
  - 1. Administrative and procedural requirements for Contract closeout, including, but not limited to, the following:
    - a. Preliminary Acceptance/Substantial Completion procedures.
    - b. Final Acceptance/Final Completion procedures.
    - c. Warranties.
    - d. Final cleaning.

#### 1.3 DEFINITIONS

- A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's observation, to determine if the Work is substantially complete.

#### 1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

#### 1.5 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 5 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Submit closeout submittals specified in other Division 01 Sections.
  - 2. Submit closeout submittals specified in individual Sections.
  - 3. Submit testing, adjusting, and balancing records.
  - 4. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Before requesting inspection for determining date of Preliminary Acceptance/Substantial Completion, complete the following. List items below that are incomplete at time of request.
  - 1. Organize and prepare Contractor's list of incomplete items or those items known to require correcting.

- a. Where requested by the Owner, provide an estimated value of items on the list, and reasons why the Work is not complete.
  2. Advise Owner of pending insurance changeover requirements.
  3. Make final changeover of permanent locks. Advise Owner's personnel of changeover in security provisions.
  4. Complete startup and testing of systems and equipment.
  5. Perform preventive maintenance on equipment used prior to Preliminary Acceptance/Substantial Completion.
  6. Instruct Owner's personnel in operation, adjustment, and maintenance of products.
  7. Submit specific warranties, maintenance service agreements, final certifications, and similar documents.
  8. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  9. Prepare and submit Project Record Documents.
  10. Prepare and submit operation and maintenance manuals.
  11. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
  12. Participate with Owner in conducting inspection and walkthrough.
  13. Terminate and remove temporary facilities, along with construction tools.
  14. Complete final cleaning requirements.
  15. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Review of In-Place Work: Submit a written request for inspection to determine Preliminary Acceptance/Substantial Completion; notify Owner of date the Work will be completed and ready for review. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements.
1. Owner may direct Architect or others to visit the site and prepare a written review of in-place work, identifying items found that do not comply with Contract Documents, are incomplete, or otherwise require correcting.
  2. Owner will organize and issue to Contractor Architect's and other lists for Contractor to address.
  3. Results of completed review will form the basis of requirements for Final Completion unless additional review is necessary.
- E. Certificate: If requested, Owner will prepare the Certificate of Preliminary Acceptance/Substantial Completion after review or will notify Contractor of items, either on Contractor's list or additional items identified that must be completed or corrected before certificate will be issued.
- F. Costs of Additional Review: Contractor shall reimburse Owner for all costs incurred for additional review of incomplete or non-compliant work. Owner will execute a change to the Contract Sum.

#### 1.6 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Acceptance/Final Completion, complete the following:
1. Submit a final Application for Payment.
  2. Certified List of Incomplete Items: Submit certified copy of Preliminary Acceptance/Substantial Completion list of items to be completed or corrected (punch list). Contractor shall state that each item has been completed or otherwise resolved for Owner's acceptance.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

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

#### 1.7 LIST OF INCOMPLETE OR DEFICIENT ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations with incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  1. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
  2. Identify in list a column for parties and actions required to complete or to correct the Work, to distribute to subcontractors and others affected.
  3. Develop a schedule to complete the Work as soon as possible, within the closeout time indicated.

#### 1.8 SUBMITTAL OF PROJECT WARRANTIES

- A. General Warranty: Warranties in individual Sections shall not deprive Owner of other rights Owner may have under prevailing laws and other provisions of Contract Documents and shall be in addition to, and run concurrent with, other warranties made under requirements of the Contract Documents.
- B. Organization: Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- C. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
  1. Submit to Owner.
- D. Warranties in Paper Form: In addition to Electronic file, provide the following:
  1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive **8-1/2-by-11-inch (215-by-280-mm)** paper.
  2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- E. Copies for Operations and Maintenance: Provide additional copies of each warranty to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces. Select and use cleaners to comply with VOC limits in effect.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations. Clean the Work to the satisfaction of the Owner.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Preliminary Acceptance/Substantial Completion for entire Project or for a designated portion of Project:
    - a. Clean truck loading and receiving areas including approaches, aprons, and other features. Sweep and where required, pressure clean paved areas.
    - b. Clean staging and storage areas.
    - c. Clean Project site of rubbish, waste material, litter, and other foreign substances.
    - d. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - e. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    - g. Remove debris and surface dust from limited-access spaces, including plenums, other above-ceiling areas, shafts, and similar spaces.
    - h. Clean flooring, removing debris, dirt, and staining; clean according to manufacturer's recommendations.
    - i. Vacuum and mop concrete.
    - j. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
    - k. Clean transparent materials, including mirrors and glass in doors and windows. Polish mirrors and glass, taking care not to scratch surfaces.
    - l. Touch up and otherwise repair and restore marred finishes and surfaces.
    - m. Review and adjust operating hardware for use during occupancy.
    - n. Remove labels that are not permanent.
      - 1) Do not remove UL and other required labels and identification.
      - 2) Do not remove mechanical and electrical equipment or device nameplates or permanently affixed instructions.
    - o. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment.
    - p. Wipe surfaces of diffusers, registers, grilles and other terminal air devices.
    - q. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
    - r. Clean permanent air filters, if any. Do not clean disposable air filters.
    - s. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
    - t. Clean ducts, blowers, and coils if units were operated without filters or inadequate protections during construction or that where contamination with particulate matter is evident on inspection.
      - 1) Clean HVAC system in compliance with NADCA ACR Section 230130.52 "Existing HVAC Air-Distribution System Cleaning." Provide written report on completion of cleaning.
    - u. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
    - v. Clean strainers.

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- w. Remove all packaging and packing materials.
  - x. Leave Project clean and ready for occupancy.
- C. Cleaning by Owner: Owner will contract separately for final cleanup where Contractor cleaning is inadequate to produce satisfactory results as judged solely by Owner. The Owner will adjust the Contract Sum by Change Order for payment for its costs for final cleaning.
- D. Construction Waste Disposal: Comply with waste-disposal requirements in Division 01 Section "Construction Waste Management and Disposal."

END OF SECTION 01 77 00



SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA - ELECTRONIC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:
  - 1. Administrative and procedural requirements for preparing operation and maintenance manuals.

1.3 CLOSEOUT SUBMITTALS

- A. Closeout Submittals: Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
- B. Initial Manual Submittal: Submit draft PDF copy of each manual. Architect may comment on whether general scope and content of manual are acceptable.
  - 1. Correct or revise each manual to comply with Architect's comments, if any.
- C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Preliminary Acceptance/Substantial Completion.
  - 1. Submit in PDF format on digital media acceptable to Owner and three paper copies, bound.
- D. Procedures: Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.4 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
  - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
  - 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files. Create composite manual.
- B. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
  - 1. Binders: Heavy-duty, three-ring, vinyl-covered, binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents.
    - a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title, name and contents. Indicate volume number.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Foldouts: Fold drawings to same size as text pages and use as foldouts.
4. Oversize Drawings: If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual.

#### 1.5 REQUIREMENTS FOR OPERATION AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system.
  1. Table of Contents: List each product included in manual.
  2. Manual Contents: Organize into sets of manageable size.
  3. Identification: In each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

#### 1.6 MAINTENANCE MANUALS

- A. General: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information. Include
  1. Include product information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds.
  2. Include the following, as applicable:
    - a. Product name, manufacturer's name, and other pertinent information.
    - b. Color, finish, pattern, and texture as applicable, material and other characteristics.
    - c. Equipment, fixture, or device description, series, model, and serial numbers, parts diagrams, and ordering information.
    - d. Reordering information.
    - e. Inspection procedures.
    - f. Types of cleaning agents to be used and methods of cleaning.
    - g. List of cleaning agents and methods of cleaning detrimental to product.
    - h. Schedule for routine cleaning and maintenance.
    - i. Repair instructions.
    - j. Lists of materials and local sources of materials and related services.
- B. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
  1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 23

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS - ELECTRONIC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Administrative and procedural requirements for Project Record Documents, including:
    - a. Record Drawings.
    - b. Record Specifications.
    - c. Miscellaneous record submittals.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit copies of Record Drawings as follows:
    - a. Initial Submittal:
      - 1) Submit PDF electronic files of Record Documents.
      - 2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
    - b. Final Submittal:
      - 1) Submit corrected and completed PDF electronic files of scanned Record Documents.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and Contract modifications.
- C. Miscellaneous Record Submittals: Comply with requirements of individual Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
  - 1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Accurately record information in an acceptable drawing technique.
    - c. Record data as soon as possible after obtaining it.
    - d. Record and check the markup before enclosing concealed installations.

- e. Cross-reference record prints to corresponding photographic documentation.
  - f. Prepare items to be incorporated in Project record documents concurrent with progress of the Work, including modifications, concealed conditions, field changes, product selections, and other notations incorporated.
2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional and location changes.
    - b. Revisions to details shown on Drawings.
    - c. Locations and depths of underground piping and conduits.
    - d. Routing of piping and conduits.
    - e. Revisions to electrical circuitry.
    - f. Actual equipment locations.
    - g. Duct size and routing.
    - h. Locations of concealed internal utilities.
    - i. Changes made by Change Order or Construction Change Directive.
    - j. Changes made following Owner's written orders.
    - k. Details not on the original Contract Drawings.
    - l. Field records for concealed or unexpected conditions.
    - m. Record information on the Work that is shown only schematically.
    - n. Proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
    - o. Name of manufacturer, supplier, installer, and other information necessary to provide a record of selections made.
  3. Mark Contract Documents and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information.
  4. Use colors other means to distinguish between changes for different categories of the Work at same location.
  5. Mark important additional information that was either shown schematically or omitted from original Drawings.
  6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Format: Annotated PDF electronic file with comment function enabled.
  2. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
  3. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

## 1.5 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  3. Record the name of manufacturer, supplier, installer, and other information necessary to provide a record of selections made.
  4. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

- B. Format: Submit record specifications as annotated PDF electronic file.

1.6 MISCELLANEOUS RECORD SUBMITTALS

- A. Miscellaneous Records: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.

1.7 MAINTENANCE OF RECORD DOCUMENTS

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 39

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
  - 1. Instruction in operation and maintenance of systems, subsystems, and equipment.

1.3 CLOSEOUT SUBMITTALS

- A. Attendance Records and Receipt of Demonstration and Training: Submit within 15 calendar days of end of all demonstration and training.
  - 1. At completion of training, submit complete training manual(s) for Owner's use prepared in same PDF file format required for operation and maintenance manuals specified in Division 01 Section "Operation and Maintenance Data."
  - 2. Include a copy of each in record documents submittal; comply with submittal requirements per Division 01 Section "Project Record Documents."

1.4 COORDINATION

- A. Schedule: Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Instructors: Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Content: Coordinate content of training with content of operation and maintenance manuals.

1.5 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training: Train Owner's personnel as applicable to the system, equipment, or component:
  - 1. Emergencies: Include the following, as applicable:
    - a. Instructions on meaning of warnings, trouble indications, and error messages.
    - b. Instructions on stopping.
    - c. Shutdown instructions for each type of emergency.
    - d. Operating instructions for conditions outside of normal operating limits.
    - e. Sequences for electric or electronic systems.
    - f. Special operating instructions and procedures.

2. Operations: Include the following, as applicable:
  - a. Startup procedures.
  - b. Equipment or system break-in procedures.
  - c. Routine and normal operating instructions.
  - d. Normal shutdown instructions.
  - e. Required sequences for electric or electronic systems.
  - f. Special operating instructions and procedures.
3. Adjustments: Include the following:
  - a. Alignments.
  - b. Checking adjustments.
  - c. Noise and vibration adjustments.
  - d. Economy and efficiency adjustments.
4. Troubleshooting: Include the following:
  - a. Diagnostic instructions.
  - b. Test and inspection procedures.
5. Maintenance: Include the following:
  - a. Inspection procedures.
  - b. Types of cleaning agents to be used and methods of cleaning.
  - c. Procedures for routine cleaning.
  - d. Procedures for preventive maintenance.
  - e. Procedures for routine maintenance.
  - f. Instruction on use of special tools.
  - g. Spare parts location and use.
6. Repairs: Include the following:
  - a. Diagnosis instructions.
  - b. Minor repair instructions.
  - c. Instructions for identifying parts and components.
  - d. Review of spare parts needed for operation and maintenance (within limitations of minor repairs).

#### 1.6 INSTRUCTION

- A. Instructors: Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
- B. Scheduling: Provide instruction at mutually agreed-on times.
  1. Schedule training with Owner with at least 7 days' advance notice.

#### 1.7 DEMONSTRATION AND TRAINING

- A. Training and Demonstration: Review written materials, record documentation, instructions, procedures, protocols, maintenance and operating instructions. Provide instruction to the satisfaction of participants.
  1. Review prerequisites that are required to maintain warranties in full effect.

### PART 2 - PRODUCTS

### PART 3 - EXECUTION

END OF SECTION 01 79 00

SECTION 02 41 19.42 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of portions of existing interior tiling flooring, including but not limited to:
  - a. Demolition and removal of dimension stone, porcelain, and other tiling.
  - b. Demolition and removal of metal edging.
  - c. Demolition and removal of setting beds, adhesives, partially- or un- bonded floor leveling compounds and other floor fills.
  - d. Removal is to the level of existing concrete floor (rough slabs) to remain.
2. Demolition and removal of portions of existing carpet floorcoverings, including but not limited to:
  - a. Demolition and removal of adhesives, mastics, partially- or un- bonded floor leveling compounds and other floor fills.
  - b. Demolition and removal of carpeting padding, to the extent present.
  - c. Removal is to the level of existing concrete floor (rough slabs) to remain.
3. Demolition and removal of selected interior non-loadbearing walls and partitions or selected portions of interior non-loadbearing walls and partitions including but not limited to:
  - a. Demolition and removal of applied finishes.
    - 1) Remove tiling and tiling substrates with walls to be demolished.
  - b. Demolition and removal of standing and running trim.
  - c. Demolition and removal of resilient and other base.
  - d. Demolition and removal of non-structural metal and supplemental framing.
  - e. Demolition and removal of selected proprietary recessed standards, hanging and other hardware, and related fixturing and accessories contained within wall and partitions demolished.
  - f. Salvage remaining hanging and other hardware and turn over to Owner unless otherwise directed.
  - g. Owner will remove merchandise, placards, merchandising signage, and other products from fixturing prior to removal.
4. Demolition and removal of portions of interior non-loadbearing partitions to facilitate the construction of new openings including:
  - a. Disconnection, demolition and removal of line-voltage conductors, devices and equipment, conductors, wiring, conduits, boxes and enclosures, electrical branch distribution and related items affected by demolition.
5. Demolition and removal of applied finishes from non-loadbearing walls, partitions, and column enclosures to remain, including but not limited to:
  - a. Demolition and removal of standing and running trim.
  - b. Demolition and removal of resilient, carpet, and other base.
  - c. Demolition and removal of carpeting wainscoting.
  - d. Removal of wire-mesh fixturing and related hardware.
  - e. Removal of perimeter fixturing, paneling, other fixturing, related hardware, wood and metal shelving, mirrors and reflective surfaces, wall coverings, and accessories.



6. Demolition and removal of circular gypsum board soffits and bulkheads at fitting room vestibules, including but not limited to:
  - a. Demolition and removal of gypsum board.
  - b. Demolition and removal of non-structural metal framing, suspension systems, bracing and hangers, struts, wires, and other attachments.
  - c. Demolition and removal of lamps, lighting, fixtures, and illuminated exit signage occurring in soffits.
  - d. Disconnection, demolition and removal of associated branch electrical circuits and line-voltage conductors to source panelboard, unless removal is to point in branch circuitry to remain in service.
7. Demolition and removal of selected casework, cash wraps, trim, perimeter and other fixtures, hardware and accessories, including such items as not otherwise removed by Owner or by other trades and disciplines including:
  - a. Demolition and removal of perimeter fixturing including fin walls, corner fillers, end fillers, bases, platforms, and similar fixturing in entirety.
  - b. Disconnection, demolition and removal of line-voltage conductors, devices and equipment, conductors, wiring, conduits, boxes and enclosures, electrical branch distribution and related items, to source panelboard, unless removal is to point in branch circuitry to remain in service.
  - c. Disconnection, demolition and removal of lighting lamps and fixtures at perimeter fixturing valances.
  - d. Handling and disposal of ballasts, bulbs, and lamps in accordance with provisions indicated.
  - e. Demolition and removal of outriggers and other support for valances.
  - f. Demolition and removal of hardware and other items not otherwise removed and not to be turned over to Owner.
8. Demolition and removal of free standing cash wraps and related millwork in entirety including:
  - a. Disconnection of electrical branch circuitry from source branch circuit to remain in floor box. Terminate feeding conductors in box according to codes and standards in effect including NEC.
  - b. Disconnection of communications data and other low-voltage cabling from cash wrap. Coil loose cabling in floor box. Do not cut cabling.
  - c. Removal of fire extinguishers from cash wrap for proper disposal.
  - d. Install or reinstall cover or covers on floor boxes after removal of cash wrap millwork.
9. Demolition and removal of loose fixtures, mannequins, other items and accessories, including such items as not otherwise removed by Owner or Owner's separate forces.
10. Demolition and removal of wood and metal shelving not otherwise removed by Owner or Owner's separate forces.
11. Demolition and removal of selected interior doors, frames, door hardware, and related accessories, including anchorage.
12. Demolition and removal of selected non-illuminated, surface-mounted branding and merchandizing signage from interior walls and partitions and valances to remain including:
  - a. Remove adhesives and mastics not containing asbestos containing materials (ACMs), and other means of attachment of signage.
13. Demolition and removal of selected resilient and other base from interior walls and partitions to remain.
14. Demolition and removal of selected portions of gypsum board ceilings, suspension systems, and related construction, including gypsum board, main and supplemental framing, hangers, attachments, and related accessories.
15. Demolition and removal of selected portions of acoustical panel ceilings, suspension systems, and related construction, including ceiling panels, main beams and cross tees, trim, hangers, attachments, bracing, struts, and related accessories.
16. Demolition and removal of selected portions of interior ceilings, suspension systems, and related construction, including gypsum board and suspended acoustical ceilings, main and supplemental framing, hangers, attachments, and related accessories.

17. Demolition and removal of selected portions of fitting room partitions and doors, related hardware, wall-mounted fitting room mirrors, and accessories.
  - a. Disconnection, demolition and removal of line-voltage conductors, devices and equipment, conductors, wiring, conduits, boxes and enclosures, electrical branch distribution and related items for lit mirrors.
18. Demolition and removal of selected cabinets and other furnishings in areas of selected demolition.
19. Disconnection, demolition, and removal of selected general, accent, and specialty lighting in certain ceilings to be demolished, including disassembly and removal of lamps, fixtures, brackets, hangers and accessories including:
  - a. Disconnection, demolition and removal of line-voltage conductors, devices and equipment, conductors, wiring, conduits, boxes and enclosures, electrical branch distribution and related items affected by demolition.
  - b. Handle and dispose of ballasts, bulbs, and lamps in accordance with provisions indicated.
20. Disconnection, demolition and removal of certain line-voltage conductors, devices and equipment, conductors, wiring, conduits, boxes and enclosures, electrical branch distribution and related items, in connection with interior selective demolition.
  - a. Maintain electrical line-voltage distribution and branch circuitry for power, lighting, and other devices and equipment not otherwise removed in the Work or outside the area of construction limits.
  - b. For circuitry not otherwise to remain in service, do not abandon in place. Remove circuits and conductors to source panelboards, and remove boxes, conduits, straps and hangers, and accessories, for complete removal.
21. Disconnection, demolition and removal of certain low-voltage data and communications wireways, pathways, conductors, low-voltage devices and related items, in connection with interior selective demolition.
  - a. Maintain low-voltage data and communications distribution and circuitry for equipment not otherwise removed in the Work or outside the area of construction limits.
  - b. For cabling and circuitry not otherwise to remain in service, do not in abandon in place. Remove cabling and conductors to source intermediate distribution frame (IDF) or other communications and data source locations, and remove boxes, conduits, straps and hangers, and accessories, for complete removal.
22. Disconnection, demolition and removal of certain articles of surveillance devices and equipment, line-voltage conductors, devices and equipment, wiring, conduits, boxes and enclosures, electrical branch distribution low-voltage wireways, pathways, conductors devices and related items in connection with interior selective demolition.
  - a. Maintain line- and low- voltage articles of surveillance electrical, data and communications distribution and circuitry for equipment not otherwise removed in the Work or outside the area of construction limits.
23. Demolition and removal of lamps and ballasts from selected lighting fixtures in connection with interior selective demolition.
  - a. Handle and dispose of regulated lamps in accordance with requirements indicated.
  - b. Handle and dispose of ballasts containing or suspected of containing Polychlorinated Biphenyls (PCBs) in accordance with requirements indicated.
24. Demolition and removal of systems, components, equipment, and assemblies includes hangers, attachments, straps, and similar supports and similar item in entirety, regardless of location, size, or attachment and connection to frame, where such supports are not part of the overall structural frame.
25. Other selective demolition and removal as may be required to facilitate and complete the Work, including minor cutting and removal.
26. Removal and salvage of selected price checking stations, peripherals, mountings and attachments, including accessories, for reuse.
  - a. Disassemble to the extent necessary for removal and disconnect from communications data systems. Label connections and ports.
  - b. Remove price checking station wall-mounted way-finding signage and mountings.
  - c. Label and containerize components, cabling, peripherals, and accessories. Pack screen units to prevent damage. Pack way finding signage separate from station.

- d. Turn over to Owner unless otherwise directed.
- 27. Removal and salvage of selected television/monitors/displays, including peripherals, power cords, remotes, mounts, and brackets, fasteners and accessories, for reuse.
  - a. Label and containerize components, cabling, peripherals, and other items.
  - b. Containerize and pack units to prevent damage.
  - c. Turn over to Owner unless otherwise directed.
- 28. Removal and salvage of selected fire extinguishers, mounting brackets, and accessories, for reuse.
  - a. Label and containerize extinguishers, brackets and accessories.
  - b. Store for reuse and reinstallation.
- 29. Removal and salvage of ceiling-mounted escalator way-finding signage including above-ceiling attachments and mounting brackets.
  - a. Label and containerize way-finding signage, attachments and mounting brackets, and accessories.
  - b. Store for reuse and reinstallation.
- 30. Removal and salvage of selected visual merchandising, for reuse.
  - a. Turn over to Owner unless directed otherwise.
- 31. Removal and salvage of selected interior lighting fixtures, including where required, removal of lamps and partial disassembly of fixture, for reuse including:
  - a. Relocating selected fixtures as indicated in Drawings.
  - b. Disconnection of fixtures from line-voltage electrical branch circuitry, where required.
- 32. Removal and salvage of selected wall fixturing not otherwise removed by Owner, including hanging and other hardware from interior walls and partitions to remain.
  - a. Salvage hanging and other hardware for reuse and reinstallation.
- 33. Permanently support or re-support existing water-based fire protection fire sprinkler cabinet and valve.
  - a. Support piping, cabinet, and related items to prevent sprinkler horizontal overhead or vertical piping drop from being sole means of support or anchorage.
- 34. Re-support of existing suspended acoustical panel ceilings where non-structural partitions and walls are removed that penetrate ceilings or where suspended acoustical ceilings otherwise might be left unsupported.
  - a. Support ceilings to remain to structure with wire hangers of sufficient capacity to resist seismic and forces until permanent alterations are made to ceilings.
- 35. Temporary or permanent support of existing minor mechanical equipment, to re-support equipment, including control panels and similar devices, equipment and enclosures.
- 36. Temporary support or re-support of existing electrical distribution and equipment to remain including:
  - a. Systems and components and their related conduits or bundled conduits and raceways, boxes and enclosures, electrical disconnects, panelboards and panels, devices, equipment, appliances, and accessories affected by demolition but are to remain in use and operation.
  - b. Support items to prevent conduits from acting as sole means of support or anchorage.
- 37. Temporary support or re-support of existing general, accent, and other lighting and illumination to remain including:
  - a. Systems and components, lighting fixtures and their related conduits or bundled conduits, metal-clad armored and other cabling, other raceways, boxes and enclosures, and accessories affected by demolition but are to remain in use and operation.
- 38. Temporary support or re-support of existing fire alarm appliances and devices, equipment and accessories to remain including:
  - a. Systems and components and their related conduits and raceways, boxes and enclosures, cabling, visual and audible notification devices and appliances, other equipment, and accessories affected by demolition but are to remain in use and operation.
  - b. Support items to prevent conduits from acting as sole means of support or anchorage.
- 39. Temporary support or re-support of existing low-voltage communications data distribution and equipment to remain including:
  - a. Systems and components and their related conduits and raceways, sleeves, and devices, equipment, boxes and enclosures, conduit and affected by demolition but are to remain in use and operation.

- b. Support items to prevent conduits from acting as sole means of support or anchorage.
- 40. Protection of existing water-based fire protection hose and valve cabinets.
- 41. Coordination of materiel and equipment with structural capacity, to avoid overloading structure.
- 42. Shoring and bracing as may be required by the Work, including engineering and design.
- 43. Legal disposal of waste and debris.

### 1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect and authorities having jurisdiction and including the following; where requirements conflict, comply with the most stringent provisions. Perform the Work to comply with codes and standards in effect, including:
  - 1. Division 01 Section "Codes and Standards."
  - 2. Division 01 Section "Construction Waste Management and Disposal."
  - 3. American National Standards Institute (ANSI).
  - 4. Code of Federal Regulations, (CFR) including the following:
    - a. CFR Title 29, Part 1910 "Occupational Safety and Health Standards".
    - b. CFR Title 29, Part 1926 "Safety and Health Regulations for Construction."
  - 5. Other Standards: Comply with additional standards indicated. Refer to individual publishers or sources of standards for original documents, including American National Standards Institute (ANSI), National Electrical Contractor's Association (NECA), National Electrical Manufacturer's Association (NEMA), National Fire Protection Association (NFPA), and Underwriters Laboratories (UL).

### 1.4 MATERIALS OWNERSHIP

- A. General: Unless otherwise indicated, demolition waste becomes property of Contractor.

### 1.5 INFORMATIONAL SUBMITTALS

- A. Statement of Refrigerant Recovery: For any systems removed or disturbed which involve regulated refrigerants, statement signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

### 1.6 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.
- B. Demolition Notification: Where required by the Work. file and receive approvals for demolition with Lane Regional Air Protection Agency (LRAPA).

### 1.7 PROJECT CONDITIONS

- A. Occupancy: Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
  - 1. Seek approval for scheduled times of selective demolition from all potentially affected parties.
  - 2. Include the cost of demolition activities off hours, before or after hours of normal operation, required by the Work in the Contract Sum and Contract Time (Duration).

- B. Existing Conditions: Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
  - 1. Before selective demolition, Owner will remove the following items:
    - a. Merchandise from Sales floor area in Work area.
    - b. Certain loose fixturing.
    - c. Certain wall fixturing hardware.
  
- C. Hazardous Materials: Hazardous materials may be present in areas to be selectively demolished, and may or may not be encountered in the Work.
  - 1. Suspected or presumed ACMs will be removed or remediation undertaken by Owner before start of selective interior demolition.
    - a. Owner will removed hazardous materials under a separate contract.
  - 2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Owner.
  - 3. Removal of hazardous materials including ACMs is not work of this or any other Section.
  - 4. If suspected hazardous materials are encountered, do not disturb; immediately notify Owner.
  - 5. A report on the presence of hazardous materials may be on file with the Owner for review and use. If available, examine report to become aware of locations where hazardous materials are present.
  
- D. Other Materials: Other materials may be present within the facility and may be among those indicated as part of the Work. Authorities having jurisdiction may require these to be separated from other demolition and construction waste. Treat, remove, handle, and dispose of items legally using appropriate means and procedures. Provide properly trained personnel wearing appropriate personal protective equipment (PPE) when working in the vicinity and when handling or removing these items. Materials may include:
  - 1. Painted or coated items with paints or coatings containing lead.
  - 2. Fluorescent bulbs and lamps.
  - 3. Bulbs and lamps containing mercury (Hg).
  - 4. Thermostatic and other controls containing mercury (Hg).
  - 5. Lighting ballasts and oil-filled transformers containing polychlorinated biphenyl (PCB).
  - 6. Other regulated universal waste.
  
- E. Storage or Sale: Storage or sale of removed items or materials on-site is not permitted.
  
- F. Exits: Protect existing means of egress including stairs to remain.
  - 1. Provide for temporary egress at all times of occupancy through existing stairs and horizontal exit and exit discharge as occur.
  
- G. Building Services: Maintain existing utilities and building services to remain in service and protect them against damage during selective demolition operations.
  - 1. Maintain fire-protection facilities in service during selective demolition operations.
    - a. Protect existing wet-system fire protection system, including piping, branches, fire mains, risers, valves, notification devices, fire department connections, and other equipment and devices to remain.
    - b. Protect fire pump if present, fire protection service entrance, fire water storage if present, detector check or other valves, tamper and flow switches, fire sprinkler room, and related fire protection system equipment and components.
  - 2. Maintain and protect domestic plumbing systems, domestic water hot and cold supply systems, hot water return piping, sanitary drainage, venting, waste (soils) piping, plumbing fixtures and similar plumbing trim and accessories.
  - 3. Maintain and heating, ventilation, and air conditioning systems, heating and cooling systems, low- and medium- pressure ductwork as occur, flexible ductwork, air terminal devices, grilles and dif-fusers, and other equipment and devices to remain.
  - 4. Maintain and protect electrical systems to remain, including main switchgear, dedicated electrical panelboards, motor control centers, load centers, branch, lighting, and other panels, main and dis-tributed electrical distribution, grounding, branch distribution and circuitry undisturbed by the

- Work, affected branch distribution and circuitry to remain, grounding systems, and other electrical systems, components, equipment, and devices to remain.
5. Maintain and protect communications and data systems including Point of Sale (POS) systems including POS room, telephone and communications systems, intermediate distribution frames (IDF) equipment, communications and data interface and other equipment and devices, wiring and cabling, line- and low- voltage circuits, conduits and wireways to remain.
- H. Interior Air Quality: Protection interior air quality inside and outside Work areas during and after demolition activities.
- I. Fuel-Fired Equipment: Limit the use of certain propane fuel-fired apparatus and equipment which exhaust by-products of combustion, except where:
1. Equipment is installed to exhaust contaminants and other by-products of combustion to the exterior is installed, verified, and operating, and exhaust produces negative pressure in the area or space in which by-products are generated, where such exhaust may be considered a hazard or health risk.
  2. Codes and regulations including those for indoor air quality and environmental protections are met.
- J. Noise: Establish and maintain noise abatement procedures during demolition. Mitigate and control sound to eliminate impact and effects. Provide protections against excessive noise.
1. Use personal protective equipment (PPE) when working in the vicinity of excessive noise.
  2. Adjust construction schedule where activities could disturb adjacent occupied areas. Schedule work off hours.
  3. Comply with noise regulations of authorities having jurisdiction.
- K. General Demolition: Extent of selective demolition is indicated or inferred in Drawings and contained within this and other individual Sections. Contract Documents to indicate the general extent and scope of the Work.
1. Provide all work necessary to disassemble, demolish, remove and dispose of materials as part of the Work and to comply with codes and standards in effect and Contract Documents. Provide selective demolition and controlled removal to perform the overall Work of the Project. Coordinate the extent of selective demolition with existing conditions, means and methods, and intent of the Work.
  2. Concealed conditions may include several levels and layers of construction. Remove all concealed construction as part of the Work to complete removal.
  3. If concealed conditions are encountered which are not exactly as indicated, modify work at no change to Contract Sum and Contract Time (Duration).
  4. Verify conditions and actual quantities of materials present in field.
- L. Safety: Contractor remains solely responsibility for safe work conditions.
- 1.8 COORDINATION
- A. Owner's Occupancy: Arrange selective demolition schedule so as not to interfere with Owner's operations.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
1. Comply with construction and demolition (C&D) waste hauling and disposal regulations.
  2. Comply with universal waste removal, handling, and disposal regulations.

### 2.2 MATERIALS

- A. Wire Hangers, Braces, and Ties: Capable of supporting not less than 100 lbs. (445 N) or the actual loads imposed, whichever is greater, and complying with the following:
1. Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.
  2. Stainless-Steel Wire: ASTM A580/A580M, Type 304, nonmagnetic.
  3. Nickel-Copper-Alloy Wire: ASTM B164, nickel-copper-alloy UNS No. N04400.
  4. Size: Wire diameter sufficient for its stress at 3 times hanger design load (ASTM C635/C635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch- (2.69-mm-) (12 gauge) diameter wire.
  5. Powder-Actuated Ceiling Clip Assemblies: Suitable for application indicated; corrosion-resistant per ASTM B633; of type, size, holding power, and other properties required for structural performance, to withstand loads imposed without exceeding allowable design stresses.
    - a. Ceiling Clips: Not less than 0.0897-inch (13 gauge) (2.28 mm) steel clips or other devices for attaching hangers of type indicated.
    - b. Wire Hangers: ASTM A641/A641M, Class 1 zinc coated wire hangers, soft temper; not less than 0.1055-inch- (2.7-mm-) (12 gauge) diameter steel wire.
    - c. Capacity: Capable of sustaining, without failure a load equal to at least 5 times that imposed by construction as tested according to ASTM E1190.
- B. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4; sized for loads and forces.
1. Cold-Rolled Steel: ASTM A1008/A1008M, structural steel, Grade 33 (Grade 230); not less than 0.0966-inch (2.5-mm) minimum thickness; coated with rust-inhibitive, baked-on, acrylic enamel or hot-dip galvanized after fabrication.
  2. Channel Nuts: Spring-tensioned formed or stamped steel nut or other devices designed to fit into channel slot and when tightened prevents slipping and produces permanent connection.
  3. Fasteners: ASTM A307.
  4. Fittings: ASTM A575, ASTM A576, ASTM A635, or ASTM A36/A36M.
  5. Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4. Provide with temporary filler and tee-head bolts, complete with washers and nuts.
  6. Electrical Uses: Comply with UL 5 "Standard for Surface Metal Raceway and Fittings," and ANSI/NFPA 70 Article 532 "Surface Metal Raceways and Surface Nonmetallic Raceways."
  7. Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Basis of Design: Unistrut; Atkore, International, Inc.
    - b. Eaton B-Line; Eaton.
    - c. Anvil-Strut; ASC Engineered Solutions.
    - d. Flex-Strut; Flex-Strut, Inc.
    - e. G-Strut; Gregory Industries, Inc.
    - f. H-Strut; Haydon Corporation, Inc.
    - g. Power-Strut; Atkore International, Inc.
    - h. Superstrut; ABB Installation Products Inc.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine areas and substrates with Installer present, for compliance with requirements and other conditions affecting performance.
  - 1. Verify that utilities and affected portions building systems have been disconnected and capped before starting selective demolition operations.
  - 2. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 PREPARATION

- A. Review Project Record Documents of existing construction or other existing condition and hazardous material information, if any, provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- B. Refrigerant: For any refrigerant recovery, before starting demolition, remove refrigerant from equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

### 3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Locate and identify utility services and mechanical/electrical systems serving areas to be selectively demolished. Protect heating, ventilation, air conditioning, and cooling systems and related controls and operating components remaining in the permanent structure from physical or environmental damage, water, infiltration, and contamination. Maintain services/systems unaffected or undisturbed by the Work and to remain and protect them against damage.
- B. Existing Services/Systems Affected or Disturbed by the Work: Locate, identify, disconnect, and seal or cap off utility services and mechanical, electrical, communications, related systems, and other systems, equipment, and components serving areas to be selectively demolished.
  - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
  - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
  - 3. Perform any dismantling required to complete the Work.
  - 4. Shut down, de-energize, lock out and tag out equipment including equipment beyond the work area. Remove electrical service from and de-energize electrical distribution and equipment at switchgear or source panelboard, control center, or load center in addition to local disconnect.
  - 5. Do not use heating, ventilation, air conditioning and cooling systems equipment in place of temporary equipment.
    - a. Provide ventilation required and as necessary to produce and maintain indoor air quality, including humidity and temperature control, required for demolition activities.
  - 6. Disconnect, demolish, and remove portions of buildings systems, equipment, and components indicated or otherwise requiring removal.
    - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.



- b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
- c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
- d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
- e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
- f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and cap remaining ducts with same or compatible ductwork material. Seal remaining ductwork to prevent entrance of water, debris, and dust.

### 3.4 PROTECTION

- A. Temporary Facilities and Controls: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage around Work area.
  - 1. Provide protection to ensure safe passage of personnel and public around selective demolition area and to and from occupied portions of building.
  - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  - 4. Provide barricades around floor openings, shafts, communicating openings, and similar items.
  - 5. Cover and protect furniture, furnishings, and equipment that have not been removed.
  - 6. Comply with requirements for temporary enclosures, dust control, and ventilation specified in individual Sections.
- B. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 1. Comply with codes and regulations including ANSI/ASSE 10.6 and ANSI/ASSE A10.18.
  - 2. Erect temporary protection, including barricades, fences, railings, overhead protections, temporary enclosures, and covered passageways where required.
  - 3. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  - 4. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - 5. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  - 6. Provide barricades around floor openings and protections over unprotected holes.
  - 7. Cover and protect furniture, furnishings, and equipment that have not been removed.
  - 8. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01 and individual Sections.
  - 9. Remove temporary protections when hazards no longer exist.
- C. Temporary Protection of Sales Floor and Rotunda: Provide substantial protections and other protection required to prevent damage to millwork, running and standing trim, perimeter and other fixturing, fabric panels, and other finishes outside of disturbed areas.
  - 1. Protect rotunda construction and finishes including soffits and bulkheads, transparent finished millwork and trim, and general and specialty illumination.
  - 2. Protect glass-supported handrail guardrail with wooden cap surrounding floor opening.

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

### 3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - 1. Proceed with selective demolition systematically, from higher to lower level.
  - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
  - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
  - 5. Maintain fire watch during and for at least 2 hours after flame-cutting operations.
  - 6. Maintain adequate ventilation when using cutting torches.
  - 7. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  - 8. Dispose of demolished items and materials promptly. Comply with additional requirements in Division 01 Sections.
- B. Concentrated Loads: Distribute demolition equipment and debris to avoid overloading structure.
- C. Notices: Avoid unplanned interruption of building services serving occupied areas of facility. Provide temporary services during interruptions, as acceptable to affected parties and as approved or permitted by authorities having jurisdiction.
  - 1. Provide at least 72 hours' notice of interruption or shut down of service to Owner and any affected parties.
- D. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, public rights-of-way, and other adjacent occupied and used facilities.
  - 1. File, pay all fees, make notices, and receive approvals, revocable street privileges, and permits from authorities having jurisdiction for temporary partial closure or obstruction of public way.
  - 2. Provide alternate routes with signage around temporarily closed or obstructed traffic ways for duration of closure or obstruction.
- E. Removed and Salvaged Items:
  - 1. Clean salvaged items.
  - 2. Turn over items to Owner.
- F. Removed and Reinstalled Items:
  - 1. Clean and repair items to functional condition adequate for intended reuse.
  - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
  - 3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- G. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

### 3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Dimension Stone, Stone, Porcelain, and Other Tiling: Remove tiling, mortar setting beds, mastic and adhesive if present, un-bonded or partially bonded leveling compounds and other fills. Avoid pulverizing, sanding, grinding, or other method releasing airborne debris.
  1. If required, wet mist flooring prior to demolition to control release of airborne dust. Provide means to control any water beyond work areas, or use other methods.
- B. Other Floorcoverings: Remove floorcoverings, mastic, and adhesive, un-bonded or partially bonded leveling compounds and other fills. Do not use methods requiring solvent-based adhesive strippers. Use manual spades, knives, scrapers or mechanized equipment, or other means to remove adhesives. Avoid pulverizing, sanding, grinding, or other method releasing airborne debris.
- C. Extent of Flooring Removal: Remove flooring and floorcoverings to level of elevated floor concrete substrate.
- D. Acoustical Panel Ceilings: Where non-structural interior partitions or walls are removed that support edges and ends of acoustical panel ceilings to remain, install hangers to support otherwise unsupported tributary areas of ceilings. Install wire hangers and suitable attachment devices or power-actuated ceiling clips and wire hangers installed attached and secured to the building structure. Support ceilings to resist loads and forces including seismic forces, and to comply with codes and standards in effect, ASTM C636/C636M, ASTM E580/E580M, and authorities having jurisdiction.
  1. Where required, partially disassemble edges and ends of acoustical panel ceilings, removing wall angles, cross tees, brackets, clip, panels, and accessories as required to facilitate the Work.
  2. Prior to removal of partitions or walls, install hangers from structure to support suspended acoustical panel suspension system main beams and other members.
    - a. Install vertical hanger wires to withstand not less than 100 lbf (445 N) or the ceiling design load, whichever is greater.
    - b. Install seismic splay bracing connections to withstand not less than 200 lbf (889 N) or the calculated design load, whichever is greater.
    - c. Install hanger wires spaced not greater than 48 inches (1219 mm) on center or in a tributary area of 16 square feet (1.48 sq. m) or less unless otherwise indicated.
    - d. Install hanger wires not more than 6 inches (150 mm) from perimeter wall conditions unless otherwise indicated.
    - e. Splay vertical hangers only where required to miss obstructions; offset resulting horizontal forces by seismic bracing, countersplaying, or other equally effective means.
    - f. Do not exceed 1 in 6 maximum plumb of vertical for hanger wires.
    - g. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of 3 full, tight turns (360 degrees each) within a 3-inch (75-mm) length to comply with ASTM C636/C636M and ASTM E580/E 80M.
  3. Remove wall angles from perimeter of ceilings prior to demolition of partitions or walls. Carefully drill out rivets. Remove fasteners, brackets, and clips where present to loosen ceiling from partition or wall.
  4. Reinstall members, brackets, clips, and panels to supported ceilings once partitions or walls are removed.

- E. Fire Sprinkler Cabinets and Valves: Coordinate demolition and removal with wall- or partition- mounted fire sprinkler components and equipment. Install permanent support for overhead horizontal sprinkler piping, vertical sprinkler piping drop, valve cabinets, valves, and other items to remain to eliminate support by means of piping alone.
  - 1. Install permanent support and anchorage to comply with codes and standards in effect and governing authorities having jurisdiction.
    - a. Comply with requirements of NFPA 13.
    - b. Install provisions for seismic restraint of piping, cabinets, and valves.
  - 2. Use slotted metal framing systems or other suitable products applicable to conditions to support piping and cabinet and provide seismic restraint.
  
- F. Existing Circuitry: Investigate existing wiring, conduits, conductors, equipment, devices, components, and accessories to be demolished, and for those to remain. Identify items in light of overall schedule, specific activities, and interior phases of work. Identify temporary protections for existing electrical that will extend beyond work areas, sequences, and phases but that must be maintained in those area, sequences, and phases. Maintain services or systems to remain in operation.
  - 1. Disconnect and remove circuits and wiring that will become inactive by the work including demolition, and that will not be reused.
  - 2. Remove circuits and wiring to demolished equipment and devices. If not otherwise indicated, remove circuits, wiring and conduits to the source panel. Maintain portions of circuits to unaffected lighting, power, equipment, and devices required to remain in operation.
  - 3. Maintain continued service by providing temporary wiring if necessary, and permanent wiring as soon as feasible. Re-feed existing equipment, devices, outlets, receptacles to remain, either temporarily or permanently.
  - 4. Comply with additional requirements of Division 01 Section "Temporary Facilities and Controls."
  
- G. Wall-Mounted Electrical Equipment: Coordinate demolition and removal with wall- or partition-mounted electrical equipment. Install temporary support for electrical disconnects, components, devices, equipment, and related electrical enclosures, boxes, conduits, raceways, racks, and other items to remain to eliminate support by means of conduit or wire alone, and where substantial support and anchorage is required by governing codes and regulations.
  - 1. Use slotted metal framing systems or similar products listed by UL for electrical use to support equipment.
  
- H. Lamps: Remove regulated lamps from fixtures and place unbroken into approved containers for disposal.
  
- I. Ballasts and Oil-Filled Transformers: Remove ballasts from lighting fixtures. Locate and remove regulated oil-filled transformers.
  - 1. Disconnect fixtures from circuits prior to the commencement of removal. Confirm removal of line voltage from fixture.
  - 2. Remove fixture after removal of regulated lamps, cutting conductors and connectors as required.
  - 3. Remove conduit and branch circuitry that serves fixture to source panel or existing box or enclosure where circuit is to be maintained.
    - a. Install box or enclosure where required to maintain and terminate active circuitry.
  - 4. Examine fixtures to ascertain whether ballasts contain PCB oils. Perform any dismantling required to make initial determination.
    - a. Dismantle fixture and place intact any ballasts with labels including PCBs within containers separate from general demolition waste and that are dedicated for PCB disposal. Provide containers or drums suitable for disposal and capable of containing liquids and oils, with tight-fitting oil-tight lids, which are approved for disposal by authorities having jurisdiction.
    - b. Treat ballasts with labels not indicating of the presence of PCB's in the same manner as ballasts determined to contain PCBs.
  
- J. Exit Alarms: Investigate existing circuitry and protect existing wall-mounted exit alarm devices and circuitry to exterior roof exit, stair, and other doors to remain in service. Provide substantial protection

where required during activities and operations near alarms and their line-voltage circuitry, conduits, boxes and enclosures, and low-voltage wiring, conduits, and door contacts at frames, to prevent damage or loss.

- K. Fire Alarm System Components: Investigate existing circuitry and protect existing fire alarm systems, equipment, visual and audible notification devices and appliances, activation devices, duct detectors, other components, cabling, circuitry, and distribution to remain in service. Provide substantial protection where required during activities and operations near fire alarm components and systems, to prevent damage or loss.
- L. Burglar Alarm System Components: Investigate existing circuitry and protect existing burglar alarm and security systems, equipment, devices, other components, and circuitry to exterior doors to the building's roof, stairs, and elsewhere to remain in service. Provide substantial protection where required during activities and operations near burglar alarm and security components, circuitry, conduits, and distribution of systems, to protect from damage or loss.
- M. Security System Components: Investigate existing circuitry and protect existing security systems, equipment, devices, other components, and circuitry including those systems protecting exterior doors to the building's roof, stairs, and elsewhere to remain in service. Provide substantial protection where required during activities and operations near burglar alarm and security components, circuitry, conduits, and distribution of systems, to protect from damage or loss.
- N. Articles of Surveillance System Components: Investigate existing circuitry and protect existing articles of surveillance systems, equipment, ceiling-mounted and other cameras, devices, other components, line-voltage circuitry and low-voltage cabling to remain in service. Provide substantial protection where required during activities and operations near articles of surveillance equipment and systems, to protect from damage or loss.

### 3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be diverted, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site.
  - 1. Dispose of ballasts known or suspected of containing PCBs according to regulations in effect, separate from general construction and demolition waste. Dispose in general waste only those ballasts clearly labeled to contain no PCBs.
  - 2. Dispose of transformers that are labeled to contain or may contain PCBs separate from general demolition waste and in a legal manner for PCB disposal.
  - 3. Dispose of regulated bulbs and lamps intact in approved containers separate from general demolition waste where required by authorities having jurisdiction.
  - 4. Dispose of unregulated incandescent and other lamps with general demolition waste.
  - 5. Dispose of fixtures and dismantled parts with general demolition waste.
  - 6. Dispose of all waste in accordance with regulations and laws in a safe and legal manner.
- B. Debris Containers: Collect demolished materials and place in containers for disposal. Locate or relocate containers used for transportation and disposal of waste as required for progress of the Work.
  - 1. Do not allow demolished materials to accumulate on-site. Promptly dispose of demolished materials.
- C. Conveyance: Remove debris from elevated floors by means that containerize and convey debris to grade level safely.
- D. Disposal: Remove construction and demolition waste materials from Project site and divert, recycle, or dispose of them in a legal manner in approved facilities acceptable to authorities having jurisdiction.
  - 1. Do not allow demolished materials to accumulate on-site.

2. Do not burn demolished materials.
3. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
4. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
5. Comply with requirements in Division 01 Section "Construction Waste Management and Disposal."

3.8 CLEANING

- A. General: Clean portions of facilities affected upon completion of selective demolition. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 41 19.42

SECTION 05 50 00.42 - METAL FABRICATIONS - SEISMIC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Miscellaneous framing and supports, including seismic restraint.
  - 2. Slotted channel framing.
  - 3. Steel support, framing, and bracing including hangers and other fabrications not specified in other Sections.

1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect, including:
  - 1. Division 01 Section "Codes and Standards."
  - 2. Other Standards: Comply with additional standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM), National Fire Protection Association (ANSI/NFPA), Manufacturers Standardization Society (MSS), Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), and Underwriters Laboratories, Inc. (UL).

1.4 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 METALS

- A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- B. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- C. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.

- D. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
1. Size of Channels: 1-5/8 by 1-5/8 inches (41 by 41 mm) unless otherwise required.
  2. Cold-Rolled Steel: ASTM A1008/A1008M, structural steel, Grade 33 (Grade 230); not less than 0.0966-inch (2.5-mm) minimum thickness; coated with rust-inhibitive, baked-on, acrylic enamel or hot-dip galvanized after fabrication.
  3. Channel Nuts: Spring-tensioned formed or stamped steel nut or other devices designed to fit into channel slot and when tightened prevents slipping and produces permanent connection.
  4. Fasteners: ASTM A307.
  5. Fittings: ASTM A575, ASTM A576, ASTM A635, or ASTM A36/A36M.
  6. Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4. Provide with temporary filler and tee-head bolts, complete with washers and nuts.
  7. Electrical Uses: Comply with UL 5 "Standard for Surface Metal Raceway and Fittings," and ANSI/NFPA 70 Article 532 "Surface Metal Raceways and Surface Nonmetallic Raceways."
  8. Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Basis of Design: Unistrut; Atkore, International, Inc.
    - b. Eaton B-Line; Eaton.
    - c. Anvil-Strut; ASC Engineered Solutions.
    - d. Flex-Strut; Flex-Strut, Inc.
    - e. G-Strut; Gregory Industries, Inc.
    - f. H-Strut; Haydon Corporation, Inc.
    - g. Power-Strut; Atkore International, Inc.
    - h. Superstrut; ABB Installation Products Inc.
- E. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches (41 by 22 mm) by length indicated with anchor straps or studs not less than 3 inches (75 mm) long at not more than 8 inches (200 mm) on center. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B633, Class Fe/Zn 5, as needed for fastening to inserts.

## 2.2 FASTENERS

- A. General: Unless otherwise indicated, provide zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A (ISO 898-1, Property Class 4.6); with hex nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.
- C. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325 (Grade A325M), Type 3, heavy-hex steel structural bolts; ASTM A563, Grade DH3, (ASTM A563M, Class 10S3) heavy-hex carbon-steel nuts; and where indicated, flat washers.
- D. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M).
- E. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M).

## 2.3 ANCHORS

- A. Anchors, General: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.



- B. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 or ICC-ES AC193 for expansion anchors, and ICC-ES AC58 or ICC-ES AC308 for chemical anchors, as appropriate for substrate.
  - 1. Material: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
  - 2. For sustained tension loads or brace applications, provide fasteners approved for seismic loading.
  - 3. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not limited to the following:
    - a. Kwik Bolt KB-TZ2; Kwik Bolt 3; Kwik Bolt 1; Kwik Bolt VTZ (KB-VTZ); Hilti Inc.
      - 1) KB-TZ2: Comply with ICC ES ESR-4266.
      - 2) KB3: Comply with ICC ESR-2302.
      - 3) KB1: Comply with ICC ES ESR-678.
      - 4) KB-VTZ: Comply with ICC ES ESR-3904.
- C. Friction Clip Anchors: Friction clip anchors shall not be used for supporting sustained loads in addition to resisting seismic forces unless permitted according to codes and standards in effect and equipped with restraining straps or other devices. Provide lock nuts or equivalent means or product to prevent loosening of threaded connections.
  - 1. Fire Protection Systems: Cee-type beam and large flange clamps are permitted for hangers provided they are equipped with restraining straps equivalent to those indicated in NFPA 13.

## 2.4 FABRICATION, GENERAL

- A. Fabrication: Cut, drill, and punch metals cleanly and accurately. Remove sharp or rough areas on exposed surfaces. Fabricate and make connections that maintain structural value of joined pieces.
  - 1. Provide for anchorage; coordinate with supporting structure.
  - 2. Use materials and methods that minimize distortion and develop strength of base metals.
  - 3. Obtain fusion without undercut or overlap.

## 2.5 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

## 2.6 METAL SUPPORTS, HANGERS, FRAMING, BRACING, AND SEISMIC RESTRAINT

- A. General: Fabricate for vertical and horizontal fire suppression fire protection piping, stormwater discharge piping, domestic hot and cold water piping, drain vent waster sanitary sewer piping, refrigeration piping, other piping, electrical conduits, boxes, and enclosures, fire alarm conduits, and other suspended piping and conduits in accordance with codes and standards in effect and as indicated. Comply with codes and standards in effect including seismic provisions.
- B. Trapeze Pipe Support Hangers: MSS SP-58, MSS SP-69 Type 59 or as applicable, shop- or field-fabricated pipe support assembly consisting of structural carbon-steel channels, angles or other shapes with MSS SP-58 carbon steel hanger rods, nuts, saddles, U-bolts clamps, and other connectors.
- C. Ductwork Trapeze Support Hangers: Shop- or field- fabricated support assembly consisting of structural carbon-steel channels, angles or other shapes with carbon steel hanger rods, nuts, saddles, U-bolts clamps, and other connectors. Size per SMACNA "HVAC Duct Construction Standards - Metal and Flexible," including relevant chapters for rectangular duct hangers minimum sizing and minimum hanger sizing for round duct.

1. Duct Attachments: Sheet metal screw fasteners, blind rivets, and self-tapping metal screw fasteners, compatible with duct materials; with steel shapes, brackets, swivels, bolts, nuts, washers, U-bolts, and other connectors.
- D. Hanger Rods: ASTM A36/A36M; mild carbon steel rods threaded both ends, threaded one end, or continuous thread, with nuts and washers of carbon steel; sized for application and to resist loads including seismic loads.
  1. Where required for copper piping support, provide copper-coated carbon steel hanger rods and factory- or shop- fabricated MSS SP-58 Types 1-58 copper coated steel components.
- E. Slotted Channel Framing: MFMA-4; channel nuts, fittings, and fasteners sized for application and resistance to loads.
  1. Select and provide complete systems capable of resisting loads and forces imposed upon them, including seismic forces.
  2. Select and provide components for proper support and anchorage.
  3. Select and install beam clamps and friction anchors for permanent installation without loosening.
- F. Clamps and Anchorage: Malleable iron or forged steel clamp type designed and selected for load to be supported and load configuration, to fit shape of steel member or framing.
  1. For steel joist framing, use beam clamps designed to support loads from top chord only. Provide cee-clamps with locknuts and cup point set screws; provide center-loaded beam clamps where required. Provide retaining straps used to maintain clamps position on beam framing where required.
- G. Vibration Isolation and Supports: For smaller tubing or piping subjected to vibration, use clamps that have vibration dampening inserts and nylon inserted locknuts. For larger tubing or piping subjected to vibration, use neoprene or spring hangers as required. For base mounted equipment use vibration pads, molded neoprene mounts, or spring mounts as required.
- H. Supports and Restraint, Plumbing Systems: Comply with requirements of individual Sections and California Plumbing Code Title 24 Part 5, including Tables for Hanger Rod Sizes and Hangers and Supports, and other pertinent articles.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine conditions and substrates with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

- B. Fitting: Fit exposed connections accurately together to form hairline joints. Weld connections that cannot be shop welded because of shipping or other limitations.
- C. Field Welding: Comply with the following requirements:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

### 3.3 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchors: Anchor framing and supports securely to, and rigidly brace from, building structure.

### 3.4 INSTALLING METAL SUPPORTS, HANGERS, FRAMING, BRACING, AND SEISMIC RESTRAINT

- A. General: Install supports, hangers, framing, bracing and seismic restraint to comply with codes and standards in effect and requirements of items being supported. Install plumb and level, true to line and elevation unless fall is required in piping.
  - 1. Where possible, keep support hanging lengths less than 12 inches (300 mm).
  - 2. Support vertical and horizontal piping and conduits to resist loads including lateral and rotational loads. Avoid piping and conduit sagging. Provide and size shop- or field- fabricated hanger support assemblies according to codes and standards in effect and as indicated.
  - 3. Support vertical piping independently of connected horizontal piping.
  - 4. Support piping to distribute loads equally on attachments.
  - 5. Install hangers support assemblies complete with attachments, anchors, inserts, bolts, rods, nuts, washers, and other accessories.
  - 6. Select and size pipe hanger support components and attachments with pullout, tension, and shear capacities appropriate for supported loads, materials, and equipment, so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- B. Anchorage: Attach and anchor framing and connectors securely to building structure to provide a continuous load path of sufficient strength to resist loads. Fasten without consideration of frictional resistance produced by the effects of gravity.
  - 1. Use double nuts and lock washers on threaded rod supports.
- C. Field Welding: Comply with AWS D1.1/D1.1M.
- D. Metal Trapeze: Arrange for individual hanging or grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers. Fabricate from ASTM A36/A36M, carbon-steel shapes selected for loads being supported
  - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as indicated for individual pipe hangers.

- E. Roof Beams: Anchor and brace with connections permanently attached to top flange of beam between top flanges of pairs of beams wherever possible. Where possible, install angle or slotted channel framing across tops of beams within deck flutes, or across top of bottom flange between pairs of beams. Avoid securing and hanging loads from lower flange of beams wherever possible.
- F. Roof Steel Joists: Anchor and brace with connections permanently attached to top chord only; locate as close as possible to steel joist top panel points.
  - 1. Panel points occur at the intersection of diagonal or vertical web angle members, or intersections of both diagonal and vertical of joists and top chords of steel joists.
  - 2. Use center-load connections and hangers where required, to avoid twisting or torsion on joist framing, including seismic force rotation or twisting.
  - 3. Reinforce joists with vertical steel angle or other member welded or bolted in where supports, framing or bracing cannot be installed within 2 inches (50 mm) of panel points; size for loads.
- G. Accessories: Provide hanger rods, shields, pipe protection saddles, clamps and other accessories.
- H. Slotted Channel Framing System Piping and Conduit Installation: Select and install slotted channel framing, connectors, anchors, components, and accessories as part of complete system in accordance with manufacturer's written requirements and recommendations. Arrange for individual or grouping of parallel runs of piping or conduit, and support on field-assembled metal framing systems installed to resist loads and forces.
  - 1. Install complete systems capable of resisting loads and forces imposed upon them.
  - 2. Install components for proper support and anchorage.
- I. Fire Protection Piping Systems and Components: Support sprinkler piping and devices using supports, framing, hangers, bracing, clamps, trapeze supports, seismic restraint, and other framing and connections to support, carry, and restrain loads including seismic forces to comply with codes in effect and NFPA 13. Support fire protection systems piping independently from other piping systems.
- J. Plumbing Piping: Support horizontal plumbing piping at a minimum in accordance with codes in effect, ASME B31.9, ASTM F708, MSS SP-58, MSS SP-69, and MSS SP-89. Support plumbing systems piping independently from other piping systems.
  - 1. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers, unless indicated otherwise.
  - 2. Install and adjust hangers and supports to provide required pipe slopes and to not exceed maximum pipe deflections allowed by codes in effect, design slopes, and ASME B31.9 for building services piping.
- K. Mechanical Equipment and Devices: Support mechanical equipment and devices using hangers, framing, lateral and other bracing, clamps, trapeze supports, slotted channel framing systems, angle hangers, or other framing and connections to support and carry loads and forces, including seismic bracing, and restraint designed in accordance with codes and standards in effect.
- L. Ductwork, In-Line Components, and Terminal Devices: Comply with codes in effect, SMACNA "HVAC Duct Construction Standards - Metal and Flexible," including Chapter 5 "Hangers and Supports," and Table 5-1 "Rectangular Duct Hangers Minimum Size," and Table 5-2 "Minimum Hanger Sizes for Round Duct," to support and carry loads and forces, including seismic forces, and restraint designed in accordance with codes and standards in effect. Support and restrain ductwork independently from other ductwork and other systems.

3.5 PROTECTION

- A. Final Protections: Provide final protection and maintain conditions, in a manner acceptable to Installer, which ensure that metal fabrications are without damage or deterioration at time of Preliminary Acceptance/Substantial Completion.

END OF SECTION 05 50 00.42

SECTION 06 10 53 - MISCELLANEOUS CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Miscellaneous carpentry using fire-retardant treated products.
  - 2. Fasteners and anchors.

1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect, including:
  - 1. Division 01 Section "Codes and Standards."
  - 2. Other Standards: Comply with additional standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM), American Wood Council (AWC), Department of Commerce National Institute of Standards and Technology (DOC), and Underwriters Laboratories, Inc. (UL).

1.4 PERFORMANCE REQUIREMENTS

- A. Fire-Retardant Treated Products: Treat and manufacture wood products with fire-retardant treatment acceptable to authorities having jurisdiction, with fire-test-response characteristics indicated, suitable for service conditions.
- B. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or other agency acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies; dress lumber S4S; factory marked.

## 2.2 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Fire-retardant-treated lumber and plywood products; flame-spread index of 25 or less when tested according to ASTM E84 and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
  - 1. Corrosivity: AWPA E12; treatment shall not promote corrosion of metal fasteners.
  - 2. Hygroscopicity: AWPA E6; ASTM D3201.
  - 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity.
  - 4. Design Value Adjustment Factors: Tested according to ASTM D5664; design value adjustment factors calculated according to ASTM D6841
  - 5. Fire Surface Burning Classification: AWPA C20; ASTM E662; UL 723; ASTM E84 and NFPA 255: FR-S.
  - 6. Products: Subject to compliance with requirements, provide one of the following:
    - a. Dricon FRT Wood; Dricon; Arch, division of Lonza Wood Protection.
      - 1) Comply with ICC-ES ESR-1626.
    - b. Fire Pro FRTW; Osmose, Inc.
      - 1) Comply with ICC-ES NER-577.
    - c. Pyro-Guard; Hoover Treated Wood Products, Inc.
      - 1) Comply with UL ER-7002-01.
    - d. No substitutions permitted.
- B. Kiln Dried: Kiln-dry lumber after treatment to maximum moisture content of 19 percent. Kiln-dry plywood after treatment to maximum moisture content of 15 percent.
- C. Dimensional Lumber: Standard or No. 2 Common grade of any species; non-stress graded unless stress-graded is required by condition or use; for concealed conditions.
- D. Identification: Factory mark panels.
- E. Application: Treat all miscellaneous carpentry, including lumber and plywood unless otherwise indicated.

## 2.3 FASTENERS

- A. General: Provide fasteners of size and type indicated and required to comply with Project requirements.
  - 1. Provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or ASTM F2329; or of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Screws for Fastening to Metal Framing: ASTM C1002 or ASTM C954, length as recommended by screw manufacturer for material being fastened.
- D. Bolts: ASTM A307, Grade A (ASTM F568M, Property Class 4.6); with ASTM A563 (ASTM A563M) hex nuts and, where indicated, flat washers.
- E. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 or ICC-ES AC193 for expansion anchors, and ICC-ES AC58 or ICC-ES AC308 for chemical anchors, as appropriate for the substrate.
  - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not limited to the following:
  - a. Kwik Bolt KB-TZ2; Kwik Bolt 1; HSL-3-G; Hilti Inc.
    - 1) KB-TZ2: Comply with ICC ES ESR-4266.
    - 2) KB1: Comply with ICC ES ESR-678.
    - 3) KB3: Comply with ICC ESR-2302.
    - 4) HSL: Comply with ICC ES ESR-1545.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine areas and substrates with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 INSTALLATION, GENERAL

- A. General: Comply with APA Form E30, AF&PA WCD 1, "Details for Conventional Wood Frame Construction," AWC "NDS National Design Specification for Wood Construction." Set miscellaneous carpentry true to line and elevation, plumb, cut and fitted to other construction; scribe and cope as needed. Locate furring, nailers, blocking, grounds, and similar supports where required for attaching other construction.
- B. Blocking: Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- C. Fasteners: Use fasteners of appropriate type and length to connect carpentry to substrates and grounds. Pre-drill wood where required. Set fasteners flush with wood. Do not overdrive or break face ply of attached plywood products. Countersink fastener heads where required.
- D. Metal Framing: Use screw fasteners of appropriate type and length for application and that penetrate metal by not less than 3 full threads. Draw lumber or panel products tight to framing.
  1. Pneumatic pins and nail fasteners are not permitted.

### 3.3 INSTALLATION OF WOOD BLOCKING

- A. General: Install where indicated and where required for supporting and attaching wall-mounted fixtures, equipment, facing materials and panels, specialty items, trim, and other work, whether or not indicated in Drawings. Attach items to substrates to support applied loading.
  1. Securely attach, fasten, and anchor blocking. Coordinate locations with other work involved.
- B. Cold-Formed Metal Framing: Use screw fasteners of appropriate type and length to attach lumber and panel products to cold-formed metal framing. Draw lumber or panel products tight to framing.
  1. Pneumatic pins and nail fasteners are not permitted.



3.4 PROTECTION

- A. Protection: Protect miscellaneous carpentry from wetting.

3.5 PROTECTION

- A. Final Protections: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure interior miscellaneous carpentry is without damage and deterioration at the time of Preliminary Acceptance/Substantial Completion.

END OF SECTION 06 10 53

## SECTION 07 81 16 - APPLIED FIRE PROTECTION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  1. Patching and repair of sprayed fire-resistive materials (SFRM) disturbed or damaged during construction.
  2. Primers, bonding agents, and other auxiliary materials.
  3. Preparation of substrates.

#### 1.3 DEFINITIONS

- A. SFRM: Sprayed fire-resistive materials.

#### 1.4 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect and authorities having jurisdiction including the following; where requirements conflict, comply with the most stringent provisions.
  1. Division 01 Section "Codes and Standards."
  2. National Fireproofing Contractors Association (NFCA) including:
    - a. NFCA 100 "Standard Practice for the Application of Spray-Fire Resistive Materials."
  3. Underwriters Laboratory (UL) including:
    - a. UL 263 "Fire Tests of Building Construction and Materials."
  4. Other Standards: Comply with additional codes and standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM).

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by sprayed fire-resistive material manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

#### 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply fire protection when ambient or substrate temperature is above or below manufacturer's requirements.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Assemblies: Provide fire protection, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.
- B. Source Limitations: Obtain fire protection from single source.
- C. Fire-Resistance Design: As indicated, tested according to ASTM E119 or UL 263, to provide fire-resistance rating to meet or exceed existing fire ratings; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Steel members are to be considered unrestrained unless specifically noted otherwise.
- D. Asbestos: Provide products containing no detectable asbestos.

### 2.2 SPRAYED FIRE-RESISTIVE MATERIALS

- A. Sprayed Fire-Resistive Material: Manufacturer's standard, factory-mixed, cementitious, dry formulation, complying with fire-resistance design requirements, and mixed with water at Project site to form a slurry or mortar before conveyance and application.
  - 1. Products, UL Design D925, N706, X854, Y710: Subject to compliance with requirements, provide the following:
    - a. Basis of Design: Type MK-10HB; MK-10HB Extended Set; GCP Applied Technologies Inc.
      - 1) Comply with UL Certificate 20160502-R4339.
  - 2. Products, UL Design D949, N791, X771, Y725: Subject to compliance with requirements, provide the following:
    - a. Southwest Type 5MD; southwest Fireproofing Products Company; Carbolite Company.
  - 3. Products, UL Design D902, N743, X790: Subject to compliance with requirements, provide the following:
    - a. CAFCO 300 HS; CAFCO; Isolotek International.
      - 1) Comply with UL Certificate 20160901-R3749 and UL ER13348-01.
  - 4. Application: Interior use; exposed-to-view and concealed (protected) locations.
  - 5. Bond Strength: Minimum 430-lbf/sq. ft. (20.59-kPa) cohesive and adhesive strength based on field testing according to ASTM E736.
  - 6. Density: Not less than density specified in the approved fire-resistance design, according to ASTM E605; not less than 15-lb/cu. ft. (240 kg/cu. m).
  - 7. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E605, whichever is thicker.
  - 8. Combustion Characteristics: ASTM E136.
  - 9. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    - a. Flame-Spread Index: 10 or less.
    - b. Smoke-Developed Index: 10 or less.
  - 10. Compressive Strength: Minimum 1440 lbf./sq. ft. (68.9 kPa) according to ASTM E761.
  - 11. Corrosion Resistance: No evidence of corrosion according to ASTM E937.
  - 12. Deflection: No cracking, spalling, or delamination according to ASTM E759.
  - 13. Bond Impact: ASTM E 760.
  - 14. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E760.
  - 15. Air Erosion: Maximum weight loss of 0.025 g/sq. ft. (0.270 g/sq. m) in 24 hours according to ASTM E859.
  - 16. High Velocity Air Erosion: ASTM E859; no continued erosion after minimum 4 hours.

17. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in no growth on specimens per ASTM G21.
18. Corrosion Resistance: ASTM E937.
19. Finish: Spray-textured or troweled finish for any exposed applications; as applied where concealed.

### 2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that are compatible with sprayed fire-resistive material and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
  1. Provide primers, accelerators, bonding agents, lath, fabric, mesh, or other products and materials required by installation and design.
- B. Substrate Primers: Primers approved by sprayed fire-resistive material manufacturer and complying with one or both of the following requirements:
  1. Primer and substrate are identical to those tested in required fire-resistance design by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
  2. Primer's bond strength in required fire-resistance design complies with specified bond strength for sprayed fire-resistive material and with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction, based on a series of bond tests according to ASTM E736.
- C. Accelerator: Product approved by fireproofing manufacturer and complying with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction.
- D. Bonding Agent: Product approved by sprayed fire-resistive material manufacturer and complying with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction.
  1. Fire Classification: ASTM E 84; Class A.
  2. Flame Spread: ASTM E 84; 10 or less.
  3. Smoke Developed: ASTM E 84; 10 or less.
- E. Metal Lath: Expanded metal lath fabricated from material of weight, configuration, and finish required, according to fire-resistance designs indicated and sprayed fire-resistive material manufacturer's written instructions. Include clips, lathing accessories, corner beads, and other anchorage devices required to attach lath to substrates and to receive sprayed fire-resistive material.
- F. Reinforcing Fabric: Glass- or carbon-fiber fabric of type, weight, and form required to comply with fire-resistance designs indicated; approved and provided by sprayed fire-resistive material manufacturer.
- G. Reinforcing Mesh: Metallic mesh reinforcement of type, weight, and form required to comply with fire-resistance design indicated; approved and provided by sprayed fire-resistive material manufacturer. Include pins and attachment.
- H. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10 mils (0.25 mm) minimum thickness, with flame-spread rating of 75 or less and smoke density rating of 300 or less per ASTM E 84.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 PREPARATION

- A. General: Conduct tests according to sprayed fire-resistive material manufacturer's written instructions to verify that substrates are free of substances capable of interfering with bond.
  - 1. Where required, perform series of bond tests specified in UL's "Fire Resistance Directory" and ASTM E736.
  - 2. If primed and coated substrates cannot be positively identified in accordance with UL's "Fire Resistance Directory" and ASTM E736, perform either of the following:
    - a. Remove unidentified and presumed incompatible primers or coatings in entirety in each area by abrasive media blasting, media selected for removal characteristics, or
    - b. Provide in all areas of presumed incompatible primers or coatings full lath application as required by ASTM E736, lathing attached to substrates.
- B. Protection: Cover other work subject to damage from fallout or overspray of fire protection materials during application.
  - 1. If used, provide fire-resistant reinforced polyethylene sheet products.
- C. Substrates: Clean substrates of substances that could impair bond of fire protection. Verify that substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, paints, and encapsulants, or other foreign substances capable of impairing bond of fire protection with substrates under conditions of normal use or fire exposure.
  - 1. Verify that objects penetrating fire protection, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
  - 2. Verify that substrates receiving fire protection are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fire protection application.
- D. Unidentified Substrates: For primed and coated substrates that cannot be positively identified in accordance with UL's "Fire Resistance Directory" and ASTM E736, perform one of the following:
  - 1. Remove unidentified and presumed incompatible primers or coatings in entirety in each area.
  - 2. Install in all areas of presumed incompatible primers or coatings full lath application as required by ASTM E736, lathing attached to surfaces to receive fireproofing. Provide applied fire protection of minimum thickness and other characteristics to maintain minimum hourly fire-resistance rating indicated, or if not otherwise indicated, not less than the fire rating of the existing assembly.
- E. Priming and Bonding Agents: Prime substrates where included in fire-resistance design and where recommended in writing by sprayed fire-resistive material manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fire protection.

### 3.3 APPLICATION

- A. General: Construct fire protection assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, finishing, and other materials and procedures affecting fire protection Work.
- B. Mixing: Comply with sprayed fire-resistive material manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fire protection; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.
- C. Application: Coordinate application of fire protection with other construction to minimize need to cut or remove fire protection.
  - 1. If clips, hangers, supports, sleeves, tracks, and other items penetrating fireproofing cannot be completed before initial application or fireproofing is removed to install them, apply fireproofing over installed items when complete.
  - 2. Defer installing ducts, piping, and other items that would interfere with applying fire protection until application of fire protection is completed.
- D. Auxiliary Materials: Install auxiliary materials as required, as detailed, and according to fire-resistance design and sprayed fire-resistive material manufacturer's written instructions for conditions of exposure and intended use. For auxiliary materials, use attachment and anchorage devices of type recommended in writing by sprayed fire-resistive material manufacturer.
- E. Trowel Patching: For small areas of individual penetrations not exceeding UL maximum requirements for trowel applications where permitted by authorities having jurisdiction, trowel-apply fire protection over penetrating items, to provide continuous, uninterrupted protection.
- F. Spray Patching: Spray apply fire protection. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by sprayed fire-resistive material manufacturer.
- G. Full Thickness: Extend fire protection in full thickness over entire area of each substrate to be protected.
- H. Build: Install body of fire protection in a single course unless otherwise recommended in writing by sprayed fire-resistive material manufacturer.
- I. Encapsulants: For applications over encapsulant materials, including lockdown (post-removal) encapsulants, apply fire protection that differs in color from that of encapsulant over which it is applied.
- J. Curing: Cure fire protection according to sprayed fire-resistive material manufacturer's written instructions.
- K. Enclosure: Do not install enclosing or concealing construction until after fire protection has been applied, inspected, and tested and corrections have been made to deficient applications.
- L. Finishes: Where indicated, apply fire protection to produce the following finishes:
  - 1. Manufacturer's Standard Finishes: Finish according to manufacturer's written instructions for each finish selected.

### 3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Test and inspect as required by the codes and standards in effect.
- B. Periodic Testing: Perform the tests and inspections of completed Work in successive stages. Do not proceed with application of fire protection for the next area until test results for previously completed applications of fire protection show compliance with requirements. Tested values must equal or exceed values as specified and as indicated and required for approved fire-resistance design.
- C. Defective: Fire protection will be considered defective if it does not pass tests and inspections.
  1. Remove and replace fire protection that does not pass tests and inspections, and retest.
  2. Apply additional fire protection, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.
- D. Reports: Prepare test and inspection reports.

### 3.5 CLEANING

- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.

### 3.6 REPAIRS

- A. General: As installation of other construction proceeds, inspect fire protection and repair damaged areas and fire protection removed due to work of other trades.
- B. Damage: Repair fire protection damaged by other work before concealing it with other construction.
- C. Repair: Repair fire protection by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

### 3.7 PROTECTION

- A. Final Protections: Provide final protection and maintain conditions in a manner acceptable to Installer that ensures applied fire protection is without damage and deterioration at the time of Substantial Completion/Final Acceptance.

END OF SECTION 07 81 16

## SECTION 07 84 13 - PENETRATION FIRESTOPPING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Penetrations in fire-resistance-rated assemblies.

#### 1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect and authorities having jurisdiction including the following; where requirements conflict, comply with the most stringent provisions.
  - 1. Division 01 Section "Codes and Standards."
  - 2. Factory Mutual Global (FM) including:
    - a. FM Global "Building Materials Approval Guide."
  - 3. Firestop Contractors International Association (FCIA) including:
    - a. FCIA "Firestop Industry Manual of Practice."
  - 4. International Firestop Council (IFC) including:
    - a. IFS "Inspection Guidelines for Penetration Firestop Systems and Fire Resistive Joint Systems in Fire Resistance Rated Construction."
    - b. IFC "Guidelines for Evaluating Firestop Systems Engineering Judgments."
  - 5. Underwriter's Laboratories, Inc. (UL) including:
    - a. UL 1479 "Fire Tests of Through-Penetration Firestops."
    - b. UL "Fire Resistance Directory."
  - 6. Other Standards: Comply with additional codes and standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM).

#### 1.4 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that meets one or more the following:
  - 1. Approved by FM Approvals according to FM Approvals 4991, "Approval Standard for Firestop Contractors,"
  - 2. Been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."



3. Not otherwise approved by FM or evaluated by UL, but is experienced and qualified in installing fire-resistive penetration firestopping systems similar in material, design, and extent to that indicated for this Project.

## 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Curing: Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

## 1.7 COORDINATION

- A. General: Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to firestopping system design.
  1. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

## PART 2 - PRODUCTS

### 2.1 SOURCE LIMITATIONS

- A. General: Obtain joint firestop systems for each type of joint opening indicated from single manufacturer.

### 2.2 PERFORMANCE REQUIREMENTS

- A. General: Provide firestopping systems that are designed, manufactured, and installed to resist spread of fire, smoke, or other gases according to requirements indicated and maintain fire-resistance rating of assembly penetrated or rating otherwise indicated or required. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
  1. In addition to requirements indicated, comply with:
    - a. FCIA "Firestop Industry Manual of Practice."
    - b. IFS "Inspection Guidelines for Penetration Firestop Systems and Fire Resistive Joint Systems in Fire Resistance Rated Construction."
    - c. IFC "Guidelines for Evaluating Firestop Systems Engineering Judgments."
- B. Fire-Test-Response Characteristics: Provide rated systems complying with the following requirements:
  1. Penetration firestop systems installed with products bearing the classification marking of a qualified product certification agency in accordance with listed system designs published by a qualified testing agency.
    - a. UL in its online directory "Product iQ."
    - b. Intertek Group in its "Directory of Building Products."
    - c. FM Global FM Approvals in its "Approval Guide."

## 2.3 PENETRATION FIRESTOPPING SYSTEMS

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems are to be compatible with one another, with the substrates forming openings, and with penetrating items if any.
  - 1. Basis of Design: Hilti, Inc.
    - a. Comply with ICC ES ESR-2179.
  - 2. RectorSeal Corporation.
  - 3. 3M Fire Protection Products.
  - 4. Tremco, Inc.; Tremco Fire Protection Systems Group.
- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479.
  - 1. F-Rating: Not less than the fire-resistance rating of the wall penetrated.
  - 2. Membrane Penetrations: Install recessed fixtures such that the required fire resistance will not be reduced.
- C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479.
  - 1. F-Rating: At least one hour, but not less than the fire-resistance rating of the floor penetrated.
  - 2. T-Rating: At least one hour, but not less than the fire-resistance rating of the floor. The following floor penetrations do not require a T-rating:
    - a. Those within the cavity of a wall.
- D. Penetrations in Smoke Barriers: Penetration firestopping systems with ratings determined per UL 1479.
  - 1. L-Rating: Not exceeding 5.0 cfm/sq. ft. (0.025 cu. m/s per sq. m) of penetration opening and no more than 50-cfm (0.024-cu. m/s) cumulative total for any 100 sq. ft. (9.3 sq. m) at both ambient and elevated temperatures.
- E. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E84; paintable where surfaces are indicated to be painted.
- F. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.

## 2.4 FILL MATERIALS

- A. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture; paintable where exposed.
- B. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.
- C. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.
- D. Intumescent Wrap Strips: Single-component intumescent elastomeric strips for use around combustible penetrants.

- E. Pillows/Bags: Compressible, removable, and reusable intumescent pillows encased in fire-retardant polyester or glass-fiber cloth. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.
- F. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- G. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants; paintable where exposed.
- H. Fire-Rated Cable Sleeve Kits: Complete kits designed for new or existing cable penetrations through walls to accept standard accessories.
- I. Thermal Wrap: Flexible protective wrap tested and listed for up to 2-hour fire ratings in accordance with ASTM E814/UL 1479 for membrane penetrations or ASTM E1725/UL 1724 for thermal barrier and circuit integrity protection.
- J. Fire-Rated Cable Pathways: Single or gangable device modules composed of a steel raceway with integral intumescent material and requiring no additional action in the form of plugs, twisting closure, putty, pillows, sealant, or otherwise to achieve fire and air-leakage ratings.
- K. Wall-Opening Protective Materials: Intumescent, non-curing putty pads or self-adhesive inserts for protection of electrical switch and receptacle boxes.
- L. Firestop Plugs: Flexible, re-enterable, intumescent, foam-rubber plug for use in blank round openings and cable sleeves.
- M. Fire-Rated Cable Grommet: Molded two-piece grommet made of plenum-grade polymer and foam inner core for sealing small cable penetrations in gypsum walls up to **1/2 inch (13 mm)** diameter.

## 2.5 MIXING

- A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 PREPARATION

- A. Surface Cleaning: Before installing penetration firestopping systems, clean openings to comply with manufacturer's written instructions.
- B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods.
- C. Taping: Use masking or other tape to prevent materials from contacting exposed surfaces.

### 3.3 INSTALLATION OF PENETRATION FIRESTOPPING SYSTEMS

- A. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications, and to comply with codes and standards in effect.
- B. Forming Materials: Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.
  - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- C. Fill Materials: Install fill materials by proven techniques to fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
  - 1. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

### 3.4 IDENTIFICATION

- A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches (76 mm) high and with minimum 0.375-inch (9.5-mm) strokes.
  - 1. Locate in accessible concealed floor, floor-ceiling, or other concealed space at 15 feet (4.57 m) from end of wall and at intervals not exceeding 30 feet (9.14 m).

### 3.5 OWNER'S FIELD QUALITY CONTROL

- A. General: Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2174.
  - 1. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.
- B. Inspections: Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

### 3.6 CLEANING AND PROTECTION

- A. General: Clean off excess materials as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.

### 3.7 PROTECTION

- A. General: Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

### 3.8 FIRESTOPPING SYSTEM SCHEDULE

- A. Fire-Resistive Penetration Firestopping for Metallic Pipes, Conduit, or Tubing:
  - 1. Basis of Design UL-Classified Systems: F-A-1017; F-A-5015; F-A-5016.
    - a. Concrete floor with cast-in-place firestop device.
  - 2. Basis of Design UL-Classified Systems: C-AJ-1184; C-AJ-1226; C-AJ-1278; C-AJ-1326; C-AJ-1342; C-AJ-1346; C-AJ-1372; C-AJ-1388; C-AJ-8177.
    - a. Concrete floor, wall, or partition, or masonry wall or partition.
  - 3. Basis of Design UL-Classified Systems: C-AJ-1421; C-AJ-1498.
    - a. Concrete floor, wall, or partition, or masonry wall or partition; sleeve optional.
  - 4. Basis of Design UL-Classified Systems: C-AJ-8110.
    - a. Concrete or masonry floor, wall, or partition.
  - 5. Basis of Design UL-Classified Systems: W-J-8051.
    - a. Concrete or concrete masonry unit wall or partition; multiple penetrations, with pipe insulation optional.
  - 6. Basis of Design UL-Classified Systems: W-L-1054; W-L-1249; W-L-1360; W-L-8013; W-L-8014; W-L-8019; W-L-8047; W-L-8058; W-L-8059; W-L-8065; W-L-8081.
    - a. Gypsum board wall or partition.
  - 7. Basis of Design UL-Classified Systems: W-L-1360.
    - a. Gypsum board wall or partition, large penetrations up to 24 inches (610 mm).
  - 8. Basis of Design UL-Classified Systems: W-L-8081.
    - a. Gypsum board wall or partition, multiple penetrations; HVAC line set.
  - 9. Basis of Design UL-Classified Systems: W-L-1205; W-L-1206.
    - a. Gypsum board shaft wall partition or horizontal shaft wall enclosure; with metal sleeve.
- B. Fire-Resistive Penetration Firestopping for Electrical Cables:
  - 1. Basis of Design UL-Classified Systems: F-A-3007.
    - a. Concrete floor with cast-in-place firestop device.
  - 2. Basis of Design UL-Classified Systems: C-AJ-3180.
    - a. Concrete floor, wall, or partition; sleeve optional.
  - 3. Basis of Design UL-Classified Systems: W-J-8051.
    - a. Concrete or concrete masonry unit wall or partition; multiple penetrations, with pipe insulation optional.
  - 4. Basis of Design UL-Classified Systems: W-L-3065.
    - a. Gypsum board wall or partition.
  - 5. Basis of Design UL-Classified Systems: W-L-8013; W-L-8014; W-L-8019.
    - a. Gypsum board wall or partition.
- C. Fire-Resistive Penetration Firestopping for Cable Trays with Electric Cables:
  - 1. Basis of Design UL-Classified Systems: C-AJ-4035.
    - a. Concrete floor, wall, or partition.
  - 2. Basis of Design UL-Classified Systems: C-AJ-8110.
    - a. Concrete floor, wall, or partition, or masonry wall or partition.
  - 3. Basis of Design UL-Classified Systems: W-L-4011.
    - a. Gypsum board wall or partition.
  - 4. Basis of Design UL-Classified Systems: W-L-8013; W-L-8019; W-L-8058; W-L-8059.
    - a. Gypsum board wall or partition.

- D. Fire-Resistive Penetration Firestopping for Insulated Metallic Pipes:
  - 1. Basis of Design UL-Classified Systems: F-A-5015; F-A-5016.
    - a. Concrete floor with cast-in-place firestop device.
  - 2. Basis of Design UL-Classified Systems: C-AJ-5091.
    - a. Concrete floor, wall, or partition.
  - 3. Basis of Design UL-Classified Systems: W-L-8013; W-L-8014; W-L-8019.
    - a. Gypsum board wall or partition.
  
- E. Fire-Resistive Penetration Firestopping for Groupings of Penetrants:
  - 1. Basis of Design UL-Classified Systems: C-AJ-1388.
    - a. Concrete floor, wall, or partition, or masonry wall or partition.
  - 2. Basis of Design UL-Classified Systems: C-AJ-8110.
    - a. Concrete or masonry floor, wall, or partition.
  - 3. Basis of Design UL-Classified Systems: W-J-8051.
    - a. Concrete or concrete masonry unit wall or partition; multiple penetrations, with pipe insulation optional.
  - 4. Basis of Design UL-Classified Systems: W-L-1249; W-L-8013; W-L-8019; W-L-8058; W-L-8059.
    - a. Gypsum board wall or partition.

END OF SECTION 07 84 13

## SECTION 07 92 00 - INTERIOR JOINT SEALANTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Nonstaining silicone joint sealants.
  - 2. Urethane joint sealants.
  - 3. Latex joint sealants.

#### 1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect, including:
  - 1. Division 01 Section "Codes and Standards."
  - 2. Other Standards: Comply with additional standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM).

### PART 2 - PRODUCTS

#### 2.1 SOURCE LIMITATIONS

- A. General: Obtain joint sealants from single manufacturer for each sealant type.

#### 2.2 JOINT SEALANTS, GENERAL

- A. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those classifications for type, grade, class, and uses.
- 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 joint-sealant manufacturer, based on testing and field experience.
- C. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.
- D. Colors of Exposed Joint Sealants: As indicated by manufacturer's designations in Drawings, or as otherwise selected by Owner from manufacturer's full range.

## 2.3 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested in accordance with ASTM C1248.
- B. Silicone, S, NS, 100/50, T: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Use T.
  - 1. Manufacturers: Subject to compliance with requirements, provide one of the following:
    - a. Dowsil 790; Dow Chemical Company.
    - b. 301 NS; 311 NS; Pecora Corporation.
    - c. Spectrem 800; Tremco Incorporated.
- C. Silicone, S, NS, 100/50, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Dowsil 790; Dow Chemical Company (The).
    - b. SilPruf LM SCS2700; Momentive Performance Materials.
    - c. 890 FTS; 890NST; Pecora Corporation.
    - d. Spectrem 1; Tremco Incorporated.
- D. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.
  - 1. Manufacturers: Subject to compliance with requirements, provide one of the following:
    - a. Dowsil 791; Dowsil 795; Dowsil 995; Dow Chemical Company.
    - b. SilGlaze II SCS2800; SilPruf SCS2000; Momentive Performance Materials.
    - c. 895NST; 898NST; Pecora Corporation.
    - d. Spectrem 2; Spectrem 3; Tremco Incorporated.

## 2.4 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 100/50, T, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Use NT.
  - 1. Manufacturers: Subject to compliance with requirements, provide one of the following:
    - a. Basis of Design: MasterSeal CR 195; Master Builders Solutions; MBCC Group.
    - b. SikaFlex-15LM; SikaFlex-1a; Sika Corporation.
- B. Urethane, S, NS, 25, T: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use T.
  - 1. Manufacturers: Subject to compliance with requirements, provide one of the following:
    - a. Basis of Design: MasterSeal CR 195; MasterSeal SL1; Master Builders Solutions; MBCC Group.
    - b. SikaFlex-1a; Sika Corporation.

## 2.5 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.
  - 1. Manufacturers: Subject to compliance with requirements, provide one of the following:
    - a. ASI 174; American Sealants Inc.
    - b. Alex Plus; DAP Products, Inc.



- c. AC-20+; Pecora Corporation.
- d. Tremflex 834; Tremco Incorporated.

## 2.6 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin), Type O (open-cell material), Type B (bicellular material with a surface skin), or any of the preceding types, for joint application, of size and density to control sealant depth and produce optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

## 2.7 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent; compatible with joint sealants and surfaces adjacent to joints.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 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 all foreign material that could interfere with adhesion of joint sealant.
- B. Joint Priming: Prime joint substrates where recommended. Confine to joint area.
- C. Masking Tape: Use masking tape to prevent contact of sealant or primer with adjoining surfaces. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions and with recommendations in ASTM C1193, unless more stringent requirements apply.
- B. Sealant Backings: Install sealant backings of type indicated to support sealants.
- C. Installation: Install sealants using proven techniques to place sealants so they directly contact and fully wet joint substrates, completely fill recesses in each joint configuration, and produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- D. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of concave joint profile in accordance with Figure 8A in ASTM C1193 unless otherwise indicated. Remove excess sealant.

### 3.4 REPAIRS

- A. Repairs: Cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

### 3.5 CLEANING

- A. General: Clean off excess sealant or sealant smears adjacent to joints as Work progresses according to sealant, substrate, and surrounding material manufacturers.

### 3.6 PROTECTION

- A. Final Protections: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure interior joint sealants are without damage and deterioration at the time of Preliminary Acceptance/Substantial Completion.

### 3.7 JOINT-SEALANT SCHEDULE

- A. Interior Vertical and Horizontal Non-Traffic Joints:
  - 1. Joint Sealant: Selected for condition, movement, and application from one of the following:
    - a. Silicone Joint Sealant, non-traffic.
    - b. Urethane Joint Sealant, non-traffic.
- B. Interior Vertical and Horizontal Non-Traffic Joints:
  - 1. Joint Locations:
    - a. Perimeter joints between interior wall surfaces and perimeter and other fixtures and millwork.
    - b. Joints between painted walls and resilient base.
    - c. Joints between painted walls and tile base.
    - d. Other joints as indicated.
  - 2. Joint Sealant: Latex, paintable.
- C. Horizontal Traffic Joints.
  - 1. Joint Locations:
    - a. Joints in floor tiling.
    - b. Joints between floor tiling and walls or other restraining conditions.

2. Joint Sealant: Selected for condition, movement, and application from the following:
  - a. Urethane Joint Sealant, traffic.

END OF SECTION 07 92 00

## SECTION 08 11 16 - INTERIOR HOLLOW METAL DOORS AND FRAMES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes:
  1. Interior standard steel doors and frames.
  2. Materials, frame anchors, and fasteners.
  3. Machining and reinforcement for hardware.
  4. Fitting and installation.

#### 1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect, including:
  1. Division 01 Section "Codes and Standards."
  2. Other Standards: Comply with additional standards indicated. Refer to individual publishers or sources of standards for original documents, including American National Standards Institute/Steel Door Institute (ANSI/SDI), American Society of Testing and Materials (ASTM), National Association of Architectural Metal Manufacturers-Hollow Metal Manufacturers Association (ANSI/NAAMM-HMMA) and Steel Door Institute (SDI).

#### 1.4 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to ANSI/NAAMM-HMMA 803 or ANSI/SDI A250.8.

#### 1.5 COORDINATION

- A. General: Coordinate door hardware with interior hollow metal doors and frames for reinforcements and preparations.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

- C. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153/A153M.
- D. Power-Actuated Fasteners in Concrete: Type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices.

## 2.2 INTERIOR STANDARD STEEL DOORS AND FRAMES

- A. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B.
  - 1. Doors:
    - a. Type: As indicated in Drawings.
    - b. Thickness: 1-3/4 inches (44.5 mm).
    - c. Face: Uncoated steel sheet, minimum thickness of 0.042 inch (1.0 mm) (nominal 18-gauge).
    - d. Edge Construction: Model 2, Seamless.
    - e. Edge Bevel: Manufacturer's standard beveled edge.
    - f. Core: Manufacturer's standard.
  - 2. Frames:
    - a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch (1.3 mm) (nominal 16-gauge).
    - b. Construction: Face welded or full profile welded.
  - 3. Exposed Finish: Prime.
- B. Doors: Subject to compliance with requirements, provide one of the following:
  - 1. Basis of Design: B Series; L Series; Steelcraft; Allegion plc.
  - 2. Medallion (MS) Series; Regent Series; Ceco Door Products; ASSA ABLOY.
  - 3. 747 Series; Curries Company; ASSA ABLOY.
  - 4. DE Series; Republic Doors and Frames; Allegion plc.
- C. Frames: Subject to compliance with requirements, provide one of the following:
  - 1. Basis of Design: F Series; Steelcraft, Allegion plc.
  - 2. SU Series; SQ Series; DQ Series; Ceco Door; ASSA ABLOY.
  - 3. CM Series; M Series; Curries Company; an ASSA ABLOY Group company
  - 4. ME Series; MH Series; Republic Doors and Frames; Allegion plc.

## 2.3 FRAME ANCHORS

- A. Jamb Anchors:
  - 1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
  - 2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches (610 mm) of frame height above 7 feet (2.1 m).
- B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.
- C. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
- D. Fasteners: Type suitable for application and condition, fabricated from corrosion-resistant materials.

## 2.4 FABRICATION

- A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.
  - 1. For exposed fasteners, provide countersunk, flat- or oval-head exposed screws and bolts unless otherwise indicated.
- B. Door Silencers: Drill stops to receive door silencers as follows.
  - 1. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
  - 2. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- C. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping according to ANSI/SDI A250.6, the Door Hardware Schedule, and templates.
  - 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
  - 2. Comply with ANSI/BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

## 2.5 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
  - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 PREPARATION

- A. General: Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.
- B. Hardware: Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

### 3.3 INSTALLATION

- A. General: Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with manufacturer's written instructions.
- B. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.
  - 1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8 or NAAMM-HMMA 841 and NAAMM-HMMA guide specification.
  - 2. Moldings and Stops: Secure with countersunk flat- or oval-head machine screws.
  - 3. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:
    - a. Jamb and Head: 1/8-inch (3-mm) plus or minus 1/16-inch (1.6-mm).
    - b. Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4-inch (19-mm).
- C. Hollow-Metal Frames: Comply with ANSI/SDI A250.11 or NAAMM-HMMA 840.
  - 1. Setting: Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.
  - 2. Floor Anchors: Secure with power-actuated fasteners.
  - 3. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:
    - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
    - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

### 3.4 REPAIR

- A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

### 3.5 PROTECTION

- A. Final Protections: Institute protective measures required throughout the remainder of the construction period to ensure that interior hollow metal doors and frames are without damage or deterioration at time of Preliminary Acceptance/Substantial Completion.

END OF SECTION 08 11 16

## SECTION 08 31 13 - ACCESS DOORS AND FRAMES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Access doors and frames.
  - 2. Accessories.

#### 1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect, including:
  - 1. Division 01 Section "Codes and Standards."
  - 2. Other Standards: Comply with additional standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM).

#### 1.4 ACCESS DOORS AND FRAMES

- A. Interior Flush GFRG Access Doors with Concealed Flanges:
  - 1. Description: Face of door flush with frame, with concealed flange for gypsum board installation.
  - 2. Locations: Wall and ceiling.
  - 3. Door Size: As required for application and condition.
  - 4. Door Type, Ceiling: Drop in, radius corner.
  - 5. Door Type, Wall: Drop in, square corner or concealed-hinge, square corner.
  - 6. Door and Frame Material: Unpainted glass-fiber-reinforced gypsum, with frames reinforced for hardware and fastenings.

#### 1.5 MATERIALS

- A. Glass-Fiber Reinforced Gypsum: ASTM C1381/C1381M; factory-molded, glass-fiber-reinforced gypsum plaster fabrications for interior applications; glass content and thickness to meet structural design.
- B. Inserts, Bolts, and Anchor Fasteners: ASTM A153/A153M or ASTM F2329.
- C. Joint-Treatment Materials: comply with Division 09 Section "Gypsum Board."

#### 1.6 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.



- B. General: Fabricate glass-fiber-reinforced gypsum plaster access panels and frames to comply with ASTM C1381/C1381M, with smooth-finished surfaces; repair hollows, voids, scratches, and other surface imperfections.
  - 1. Incorporate embedments into units to develop the full strength of glass-fiber-reinforced plaster fabrications. Cover embedments with not less than 3/16-inch (5-mm) thickness of glass-fiber-reinforced plaster composite.
- C. Dimensional Tolerances: ASTM C1381/C1381M and:
  - 1. Factory-Finished Edge Straightness: +/- 1/16-inch (1.5 mm).
  - 2. Plane Surface Straightness: +/- 1/8-inch (3 mm).
  - 3. Overall Assembled Length and Width: +/- 1/8-inch (3 mm).
  - 4. Square: Not more than 1/4-inch (6 mm) difference between diagonals in 16 sq. ft (1.48 sq. m).

## PART 2 - EXECUTION

### 2.1 EXAMINATION

- A. General: Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 2.2 INSTALLATION

- A. General: Comply with ASTM C1467/C1467M and manufacturer's written instructions for installing access doors and frames. Install in framed, prepared openings with finish surfaces level, plumb, true, flush and aligned with adjacent materials.
  - 1. Locate fasteners not less than 5/16-inch (7.9 mm) from edges or ends of units. Pre-drill fastener holes in flanges. Attach to framing and substrates with countersunk steel drill screws.
- B. Finishing: ASTM C 840, Level 5. Comply with Division 09 Section "Gypsum Board."

### 2.3 REPAIR

- A. General: Remove and repair or replace doors and frames that are warped, bowed, damaged, or otherwise do not comply with requirements.

### 2.4 PROTECTION

- A. Final Protections: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure access doors and frames are without damage and deterioration at the time of Preliminary Acceptance/Substantial Completion.

END OF SECTION 08 31 13

SECTION 08 71 11 - DOOR HARDWARE (DESCRIPTIVE SPECIFICATION)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Mechanical door hardware for swinging doors.
  - 2. Cylinders for interior door hardware.
  - 3. Special procedures and processes for handling select door cylinders and ordering of select door hardware for incorporation into the Work.

1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect, including:
  - 1. Division 01 Section "Codes and Standards."
  - 2. Other Standards: Comply with additional standards indicated. Refer to individual publishers or sources of standards for original documents, including American National Standards Institute/Builders Hardware Manufacturing Association (ANSI/BHMA) and American National Standards Institute/Steel Door Institute (ANSI/SDI).

1.4 QUALITY ASSURANCE

- A. Architectural Hardware Consultant Qualifications: Architectural Hardware Consultant (AHC).
- B. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." In addition to Owner and Contractor, conference participants shall also include Installer and AHC. Incorporate keying conference decisions into final keying schedule including, but not limited to, the following:
  - 1. Requirements for key control system.
  - 2. Requirements for access control.
  - 3. Address for delivery of keys.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. General: In addition to requirements of Division 01 Sections, inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
- B. Keys and Cores: Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.6 COORDINATION

- A. Electrical: Coordinate layout and installation of exit alarm devices and accessories with wall conditions for recessed mounting. Coordinate circuit, voltage requirements, and connections to line-voltage electrical systems.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Not less than 3 years from date of Preliminary Acceptance/Substantial Completion.
    - a. Manual Closers: Not less than 10 years from date of Preliminary Acceptance/Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in this Section. Products are identified in Drawings by descriptive titles corresponding to requirements specified in Part 2.
  - 1. Coordinate final door hardware schedule with doors, frames, and related work.
  - 2. Ensure proper size, thickness, hand, function, and finish of door hardware.

2.2 HINGES

- A. Hinges, General: ANSI/BHMA A156.1, Grade 2 (standard weight).
- B. Antifriction-Bearing Hinges:
  - 1. Mounting: Full mortise (butts), 5-knuckle type, unless otherwise indicated or required.
  - 2. Bearing Material: Manufacturer's standard antifriction ball bearing; not less than 2 bearings.
  - 3. Base and Pin Metal: Brass with stainless steel pin body and brass protruding heads or steel with steel pin.
  - 4. Pins: Non-rising; non-removable unless otherwise indicated.
  - 5. Tips: Flat button, unless otherwise indicated.
  - 6. Corners: Square.
  - 7. Sizing: Select for door size, thickness, and clearances required, and as follows:
    - a. Hinge Height: Minimum 4-1/2 inches (114 mm).
  - 8. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Basis of Design: BB1279; Hager Companies.
    - b. Stanley; dormakaba.
    - c. McKinney Products Company, an ASSA ABLOY Group Company.

2.1 MECHANICAL LOCKS AND LATCHES

- A. Lock Throw, Bored (Cylindrical) Locks: Minimum 1/2-inch (13-mm) latchbolt throw.
- B. Backset: 2-3/4 inches (70 mm), unless otherwise indicated.

- C. Lock Trim:
  - 1. Levers: Wrought, forged, or cast.
  - 2. Escutcheons (Roses): Wrought, forged, or cast.
  - 3. Operating Device: Lever with escutcheons (roses).
  
- D. Strikes: Manufacturer's standard strike for each lockset complying with requirements indicated, with strike box and curved lip extended to protect frame; finished to match lock or latch.
  
- E. Interior Heavy Duty Bored (Cylindrical) Locks: ANSI/BHMA A156.2, Grade 1.
  - 1. Manufacturers: Subject to compliance with requirements, provide the following:
    - a. Basis of Design: Best Access Systems; Best 9K Series.
      - 1) Storeroom Lockset: 93K37D15D.
        - a) Single Keyed Function: Storeroom; D.
        - b) ANSI Function: F86; fixed outside handle, keyed; inside handle always operable.
        - c) Core Housing Lockset: 7.
        - d) Core Lockset: Best 1C7.
        - e) Lever Style: 15.
        - f) Rosette Style: D.
      - 2) No substitutions permitted.

## 2.2 SELF-CONTAINED ELECTRONIC LOCKS

- A. Interior Self-Contained Electronic Locks: ANSI/BHMA A156.25, bored; with internal, battery-powered, self-contained electronic lock; consisting of complete lockset, motor-driven lock mechanism, and actuating device; enclosed in zinc-dichromate-plated, wrought-steel case, and strike that suits frame. Provide key override, low-battery detection and warning, LED status indicators, and ability to program at the lock.
  - 1. Actuating Device: Digital keypad.
    - a. Keypad: Vandal-resistant design; 12-button keypad; not less than 100 user codes; PIN-code length 3-5 digits; programming via pad only.
  - 2. Faceplate Material: Stainless steel.
  - 3. Trim: Lever, wrought or cast; with clutch mechanism; meeting handicapped accessibility requirements.
  - 4. Function: Deadbolt with key unless indicated otherwise.
  - 5. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. Basis of Design: Trilogy T2 DL2700 IC/26D; T2 DL2700 Series, Digital Cylindrical Lockset; Alarm Lock; Division of Napco Security Group Company.
    - b. No substitutions permitted.

## 2.3 EXIT ALARMS

- A. Exit Alarm: BHMA A156.29, Grade 1; flush mounted, mounted separate from doors and activated by door movement switch; tamper-resistant housing and cover; hardwired AC/DC alarm; with manufacturer's accessories.
  - 1. Features:
    - a. Status indicators; field selectable.
    - b. Automatic re-arming; field selectable.
    - c. Low battery alert; field selectable.
    - d. Silent arming; field selectable.
    - e. Optional 9VDC battery.
    - f. 100 db. piezo horn.
    - g. Extended bypass; allows alarm to remain silenced when door is open and automatically rearm device upon closing of door.

- h. Relay for remote signal capability.
  - i. Key control.
  - j. Primary Voltage: 120VAC to transformer.
  - k. Transformer Voltage: 24VAC.
  - l. Factory-installed IC7 housing, 7-pin; to accept Best Series core.
  - 2. Color: Manufacturer's standard gray.
  - 3. Signage: Manufacturer's warning signage.
  - 4. Manufacturers: Subject to compliance with requirements, provide the following:
    - a. Basis of Design: EAX-2500FK1xIC7; recessed-mounted flush back box; with PP-5152-2, Detex Corporation.
    - b. No substitutions permitted.
  - 5. Manufacturers, Cylinder: Subject to compliance with requirements, provide the following:
    - a. Cylinder: Best 12E72; Best Access Systems; dormakaba.
    - b. No substitutions permitted.
- B. Door Position Switches: Magnetically operated reed switch designed for concealed mounting; UL listed.
- 1. Type: Surface mount.
  - 2. Quantities: 1 for each leaf.
  - 3. Manufacturers: Subject to compliance with requirements, provide the following:
    - a. Basis of Design: Detex MS2049-S; Detex Corporation.
    - b. No substitutions permitted.

## 2.4 EXIT DEVICES AND AUXILIARY ITEMS

- A. Exit Devices and Auxiliary Items: BHMA A156.3.
- 1. Manufacturers: Subject to compliance with requirements, provide the following:
    - a. Basis of Design: 98 Series; Von Duprin; Allegion plc.
      - 1) Lever, Cylinder; key locks and unlocks.
        - a) Lever, Keyed; 98L.
        - b) Trim: 996L.
        - c) ANSI Function: 08.
    - b. No substitutions permitted.
- B. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing in accordance with UL 305.
- C. Rim Exit Devices: Grade 1.
- 1. Type: 1, rim, unless Type 4, narrow stile or Type 28, incorporating a deadbolt.
  - 2. Actuating Bar: Push pad.
  - 3. Material: Plated steel, stainless steel, and aluminum.
  - 4. Case and Push Pad: Smooth.

## 2.5 SURFACE CLOSERS

- A. Surface Closers: ANSI/BHMA A156.4; UL listed; Grade 1; heavy duty; adjustable sweep and latch speeds; adjustable to meet field conditions and requirements for opening force; including main arm, brackets, shoes, plates, spacers, adapters, supports, covers, and other items required.
- 1. Mounting: Parallel arm or standard arm to mount inside rooms or areas wherever possible, or at least visible side of door, unless otherwise required by application.
    - a. Avoid closers in public view or public spaces.
  - 2. Closing Speed: Delayed action closing.
  - 3. Backcheck: Adjustable, effective between 60 and 85 degrees of door opening.
  - 4. Cover Material: Aluminum or steel; powder coat finish.

5. Closing Power Adjustment: At least 50 percent more than minimum tested value.
6. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Basis of Design: LCN Closers; an Allegion company.
  - b. Basis of Design: 4040XP Series; LCN Closers; Allegion.
    - 1) Metal Cover: 4040-72MC.
    - 2) Delayed Action: 4040XP Series-DEL.
  - c. No substitutions permitted.

## 2.6 AUTOMATIC FLUSH BOLTS

- A. Automatic Flush Bolts: ANSI/BHMA A156.3, Type 25; minimum 3/4-inch (19-mm) throw; designed for mortising into door edge; bolts top and bottom; with stainless steel cover plate, top and bottom dustproof strikes, guides, guide supports, wear plates, and shims.
  1. Manufacturers: Subject to compliance with requirements, provide one of the following:
    - a. Basis of Design: FB31P; IVES; Allegion plc.
    - b. 2842; Rockwood; ASSA ABLOY Architectural Door Accessories; ASSA ABLOY Accessories and Door Controls Group.
    - c. 3810 with 3830 Series Trim Kit; Trimco.
    - d. No substitutions permitted.
- B. Dustproof Strikes: ANSI/BHMA A156.3, Grade 1, polished wrought brass, with 3/4-inch- (19-mm-) diameter, spring-tension plunger; same manufacturer as automatic flush bolts.

## 2.7 ACCESSORIES FOR PAIRS OF DOORS

- A. Coordinators: ANSI/BHMA A156.3; UL listed for fire-resistance rated doors; consisting of stop-mounted active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release; with mounting brackets as required.
  1. Provide filler bars (FBs) where required due to door size; field size for frame opening.
  2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Basis of Design: COR Series Coordinators; IVES; Allegion plc.
    - b. 2600 Series Coordinators; Rockwood; ASSA ABLOY Architectural Door Accessories; ASSA ABLOY Accessories and Door Controls Group.
    - c. 3094 Series Stop-Mounted Coordinators; Trimco.
    - d. No substitutions permitted.

## 2.8 MECHANICAL STOPS

- A. Dome-Type Floor Stop: BHMA A156.16 Grade 1; with not less than 1-inch- (25-mm-) high or 1-3/8-inch- (35-mm-) high bumper as required by conditions; provide with extruded aluminum riser for carpet installations where occur.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Basis of Design: FS436; FS438; as suited for application; IVES Hardware; Allegion plc.
    - b. 241F; 242F; 243F; as suited for application; Hager Companies.
    - c. 440; 441; 441CU; 441H; 442; 443; as suited for application; ASSA ABLOY Architectural Door Accessories; ASSA ABLOY Accessories and Door Controls Group.
    - d. No substitutions permitted.

- B. Wall Stop: ANSI/BHMA A156.16; Grade 1; cast brass, bronze, stainless steel, or aluminum base metal with rubber bumper; 2-1/2-inch (64-mm) diameter, minimum 3/4-inch (19-mm) projection from wall; with backplate for concealed fastener installation; with concave bumper configuration.
  - 1. Manufacturer: Subject to compliance with requirements, provide products by one of the following:
    - a. Basis of Design: WS407; IVES; Allegion plc.
    - b. 236W; Hager Companies.
    - c. 403; Rockwood; ASSA ABLOY Architectural Door Accessories; ASSA ABLOY Accessories and Door Controls Group.
    - d. No substitutions permitted.

## 2.9 METAL PROTECTIVE TRIM UNITS

- A. Metal Protective Trim Units: ANSI/BHMA A156.6; fabricated from not less than 0.050-inch- (1.3-mm-) thick stainless steel; beveled edges; predrilled; with manufacturer's standard machine or self-tapping screw fasteners; countersunk holes (CS).
  - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. Basis of Design: 8400 Series; IVES; Allegion plc.
    - b. Rockwood; ASSA ABLOY Architectural Door Accessories; ASSA ABLOY Accessories and Door Controls Group.
    - c. No substitutions permitted.
- B. Armor Plates: Not less than 42 inches (1067 mm) high by door width with allowance for frame stops.

## 2.10 AUXILIARY DOOR HARDWARE

- A. Silencers for Metal Door Frames: Grade 1; neoprene or rubber; minimum diameter 1/2 inch (13 mm); fabricated for drilled-in application to frame.

## 2.11 LOCK CYLINDERS

- A. General: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Basis of Design: Best Access Systems; dormakaba USA, Inc.
      - 1) Best 1E Series; 12E72 or 1E-74 with cam; as suited to application.
    - b. No substitutions permitted.
- B. Lock Cylinders: ANSI/BHMA A156.5; Grade 1; permanent cores that are interchangeable; face finished to match lockset.
  - 1. Number of Pins: Seven.
  - 2. Type: Mortise, rim or bored-lock type as indicated by application.
  - 3. Key-Removable: Key-retained or captive key type locks not permitted.
- C. Construction Cores: Provide construction cores that are replaceable by permanent cores.

## 2.12 KEYING

- A. Keying System: Factory registered, complying with guidelines in ANSI/BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.
  - 1. Grand Master Key System: Change keys, a master key, and a grand master key operate cylinders, unless otherwise indicated or required by Owner.

2. Keyed Alike: Where indicated, key cylinders to same change key.
- B. Keys: Nickel silver.
1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
    - a. Notation: "DO NOT DUPLICATE."
  2. Quantity: In addition to one extra key blank for each lock, provide additional keys to suite Owner's requests and master and grand master keying.

2.13 FINISHES

- A. General: ANSI/BHMA A156.18 as indicated and listed in door hardware schedule.
- B. Door Hardware Finish Schedule: Provide exposed door hardware in the following standard finishes unless otherwise indicated:

HARDWARE DESCRIPTION	FINISH, BASE METAL
1. Hinges, Interior:	652 (US26D) Satin Chromium Plated, Steel or 626 (US26D) Satin Chromium Plated
2. Mechanical Locks and Latches	626 (US26D) Satin Chromium Plated
3. Self-Contained Electronic Locks	626 (US26D) Satin Chromium Plated
4. Exit Devices	626 (US26D) Satin Chromium Plated, 630 Satin Stainless Steel, Anodized Aluminum
5. Cylinders	630 (US32D) Satin Stainless Steel
6. Surface Closers	689 (AL) Aluminum Painted; standard matching paint finish for exposed components including arms
7. Automatic Flush Bolts/Dustproof Strikes	626 (US26D) Satin Chromium Plated
8. Accessories Pairs of Doors	630 (US32D) Satin Stainless Steel or 689 (AL) Aluminum Painted
9. Metal Protective Trim Units	630 (US32D) Satin Stainless Steel
10. Other Hardware	630 (US32D) Satin Stainless Steel or 626 (US26D) Satin Chromium Plated

2.14 PROCUREMENT AND INSTALLATION OF LOCKS, LOCKSETS, TRIM, CYLINDERS, AND RELATED DOOR HARDWARE AND KEYING

- A. Ordering: Contractor shall order cylinders and self-contained electronic locks, trim, cylinders, and related door hardware, using form provided by Owner ("Lock Information Sheet"). Contractor shall:
1. Complete initial set up for payment and complete prepayment or open credit terms applications.
  2. Place orders with Bass Security Services, Inc. indicated via email.
  3. Complete Lockset Information Sheets for ordering in entirety, to avoid delay in the Work. Allow not less than 4 to 6 weeks for standard delivery of door hardware.
- B. Contractor's Responsibilities: In addition to responsibilities indicated, Contractor shall:
1. Familiarize itself with available door hardware through Owner's procurement program.
  2. Complete forms to order door hardware.
  3. Coordinate all orders for door hardware with conditions to ensure correct product ordering and updates.
  4. Provide and procure locks (lock housing units), locksets, trim, cylinders, and related door hardware with construction and permanent cores.
  5. Install locks (lock housing units), locksets, trim, construction cores, and related hardware.
  6. Revise, update, and complete additional ordering forms for changes in the Work.



- C. Bass Security Services, Inc. Responsibilities: In addition to responsibilities indicated, Bass Security Services, Inc. will:
  - 1. Coordinate Contractor's orders with the Owner's security representatives for keying purposes and deliver the permanent cores to the Owner's security department for security personnel's installation.
  - 2. Coordinate ordering and keying with Macy's Inc. Security Representative for Owner's operational region.
- D. Owner's Responsibilities: In addition to responsibilities indicated, Owner will:
  - 1. Provide permanent keying information to Bass Security Services, Inc.
- E. Bass Security Services, Inc. NACC:
  - 1. Support Team Contact Information, Team 935 (Regardless of Macy's Division):
    - a. Primary Contact (Material Quotes, Order Placement, Order Status, Lead Time, and Other Issues):
      - 1) Telephone: (866) 794-2338
      - 2) E-mail: [macys@bass-security.com](mailto:macys@bass-security.com)

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. General: Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, wall and floor construction, and other conditions affecting performance.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

#### 3.2 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with codes and standards in effect including accessibility requirements and ANSI/SDI A250.8, unless otherwise indicated or required.
- B. Installation: Install door hardware to comply with manufacturer's written instructions. Set units level, plumb, and true to line and location. Drill and countersink units that are not factory prepared.
  - 1. Install hinges of types and in quantities no fewer than recommended by manufacturer.
- C. Lock Cylinders: Install construction cores to secure building and areas during construction period.
  - 1. Remove construction cores for replacement with permanent cores as indicated in keying schedule when directed by Owner.
- D. Exit Alarms: Install in accordance with manufacturer's written instructions. Locate exit alarm operating controls at no greater than 48 inches (1219 mm) on center above finish floor, unless otherwise required by authorities having jurisdiction.
  - 1. Locate alarm adjacent to side of double leaf doors.
  - 2. Install rough in for exit alarms and transformers recessed in wall unless otherwise required by condition. Conceal line-voltage circuitry and conduits within wall or partition construction.
  - 3. Install door position switches overhead in location above each leaf. Conceal low-voltage wiring within wall. Wherever possible, route low-voltage wiring behind door frame.

3.3 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware to ensure proper operation. Adjust sweep period of closers and other functions to comply with accessibility requirements.

3.4 CLEANING

- A. General: Clean adjacent surfaces soiled by door hardware installation.

3.5 PROTECTION

- A. Final Protections: Institute protective measures required throughout the remainder of the construction period to ensure that door hardware is without damage or deterioration at time of Preliminary Acceptance/Substantial Completion.

END OF SECTION 08 71 11

SECTION 09 22 16.42 - NON-STRUCTURAL METAL FRAMING - SEISMIC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Non-load-bearing steel framing systems for interior partitions.
  - 2. Suspension systems for interior ceilings and soffits.
  - 3. Grid suspension systems for gypsum board ceilings.
  - 4. Seismic bracing and restraint for non-load-bearing steel framing systems.
  - 5. Proprietary recessed wall standards.
  - 6. Modifications to existing interior non-structural metal framing.
  - 7. Delegated design and engineering of non-structural metal framing.

1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect, including:
  - 1. Division 01 Section "Codes and Standards."
  - 2. Gypsum Association (GA), including:
    - a. GA-229 "Shear Values for Screw Application for Gypsum Board on Walls."
    - b. GA-235 "Gypsum Board Mechanical and Physical Properties."
  - 3. American Iron and Steel Institute (AISI) including:
    - a. "North American Specification for the Design of Cold-Formed Steel Structural Members."
    - b. AISI S100 "North American Specification For The Design Of Cold-Formed Steel Structural Members."
    - c. AISI "S100-12-C - Commentary On The Specification."
    - d. S200-S207 "North American Standard for Cold-Formed Steel Framing - General Provisions."
    - e. S220 "North American Standard for Cold-Formed Steel Framing - Non-Structural Members."
  - 4. Ceiling & Interior Systems Construction Association (CISCA), including:
    - a. "Ceiling Systems Handbook."
  - 5. Steel Framing Industry Association (SFIA) including:
    - a. Tech Note 1, "Limiting Heights for Nonstructural Standard and EQ Wall Studs."
  - 6. Steel Stud Manufacturers Association (SSMA) including:
    - a. SSMA "Product Technical Guide."
  - 7. Other Standards: Comply with additional standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM).

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. General: In addition to requirements of Division 01 Sections, protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI S202, "Code of Standard Practice for Cold-Formed Steel Structural Framing."

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance Characteristics: Design and install framing systems in accordance with AISI S220, "North American Specification for the Design of Cold-Formed Steel Framing - Nonstructural Members," and the following, unless otherwise indicated.
1. ASTM C645, ASTM C754, and ASTM C840.
  2. GA-229 and GA-235.
  3. SSMA "Product Technical Guide."
  4. Framing manufacturer's published load tables.
  5. Seismic Design Category: D.
  6. Maximum Deflection, Composite or Non-Composite Partitions: L/240 at 5 lbf per sq. ft (psf.) (239 Pa) unless otherwise indicated or required.
  7. Superimposed Axial Load: No greater than 200 lbf (0.89 kN).
  8. Maximum Deflection, Suspended Ceilings: L/240 at 5 lbf per sq. ft (0.24 kPa), unless L/360 at 5 lbf per sq. ft (0.24 kPa) is required to prevent sag of suspended ceiling.
  9. Suspended Ceiling Loads: Not more than uniform load of 4 lbf./sq. ft. (psf) (0.19 kPa).
    - a. For seismic forces, the weight of suspended ceilings shall include framing, light fixtures if attached to, clipped to, or laterally supported by ceiling framing; and other components laterally supported by the ceiling.
  10. Partition Framing Limiting Heights: Drawing schedules, SFIA Tech Note 1, SSMA "Product Technical Information," ASTM C754, and manufacturer's requirements.
    - a. In the event of conflicts, use the lowest limiting height to determine framing.
  11. Load Reduction: Select, erect, and install framing to comply with ICC-ES AC86 without reduction for loads; do not reduce loads per ASTM C754.
  12. Screw Design: Not less than AISI S100 or design, whichever is greater.
  13. Pullout Strength: Not less than ASTM C1513 and ASTM C645 screw spinout performance test.
  14. Seismic Performance: To resist seismic forces and sway displacement.
    - a. Out-Of-Plane Bending: Traverse or out-of-plane bending or deformation subjected to seismic forces shall not exceed deflection capability of member or system.
    - b. Ceilings:
      - 1) Suspension systems are to transmit seismic forces through ceiling attachments to building structure. Provide positive bracing at changes in ceiling plane elevation to resist anticipated seismic loads.
      - 2) Connections at framing, including main and cross members and wires to structure, are to withstand not less than 180 lbf (800 N) or the design load, whichever is greater.
      - 3) Splay bracing connections able to withstand not less than 200 lbf (889 N) or the design load, whichever is greater.
      - 4) Compression struts are to withstand not less than 180 lbf (800 N).
- B. Deflection of Building: Accommodate deflection of primary building structure of not less than 3/4-inch (19 mm) unless otherwise dictated by conditions and codes or standards in effect.

## 2.2 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ICC-ES 86, ASTM C645, AISI S220, ASTM C645, Section 10, and AISI S220 for conditions indicated.
1. Protective Coating: Comply with ASTM C645 and AISI S220; ASTM A653/A653M, G40 (Z120), hot-dip galvanized or manufacturer's standard metallic corrosion-resistant zinc coating. Galvanized products are unacceptable.
  2. Minimum Flange, Cee-Shaped Members: 1-1/4 inches (31.8 mm) unless indicated otherwise.
  3. Minimum Flange, Track: 1-inch (25.4 mm) unless indicated otherwise.
- B. Studs and Track: ASTM C645, AISI S220, ASTM C645, Section 10, and AISI S220.
1. Steel Studs and Track:
    - a. Minimum Design Base-Metal Thickness: Not less than 0.031 inch (0.80 mm) (20 gauge) Thickness Designator 30, unless otherwise required by conditions.
      - 1) No equivalent thickness framing is permitted.
    - b. Depth: As indicated on Drawings.
- C. Embossed, High Strength Steel Studs and Tracks: ASTM C645, AISI S220, ASTM C645, Section 10, and AISI S220; roll-formed and embossed with surface deformations to stiffen the framing members so that they are structurally comparable to conventional ASTM C645 steel studs and tracks.
1. Minimum Base-Metal Thickness: Not less than 0.031 inch (0.80 mm) (20 gauge) Thickness Designator 30, unless otherwise required by conditions.
    - a. Depth: As indicated on Drawings.
- D. Slip-Type Head Joints: Where required, provide one of the following:
1. Single Long-Leg Runner System: ASTM C645; top runner with 2-inch- (51-mm-) deep flanges, installed with studs friction fit into top runner and with continuous bridging located within 12 inches (305 mm) of the top of studs to provide lateral bracing.
  2. Double-Runner System: ASTM C645; top runners, inside runner with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs and fastened to studs.
  3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above.
- E. Flat Strap and Backing Plate/Clips: Steel sheet for blocking and bracing in length and width required.
1. Minimum Base-Metal Thickness: Not less than 0.031 inch (0.80 mm) (20 gauge) Thickness Designator 30 for framing unless otherwise required.
  2. Minimum Base-Metal Thickness Heavy Duty Conditions: Not less than 0.1017 inch (2.58 mm) (12 gauge) Thickness Designator 97.
- F. Cold-Rolled Channel Bridging: Steel, 0.0538-inch (1.367-mm) (16 gauge) Thickness Designator 54 minimum base-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
1. Depth: 1-1/2 inches (38 mm).
  2. Clip Angle: Not less than 1-1/2-by-1-1/2 inches (38 by 38 mm), 0.068-inch- (1.72-mm-) thick, galvanized steel.
- G. Cold-Rolled Bridging Bar: Proprietary steel angle bridging with pre-notched, pre-spaced flanges to position and rigidly hold studs at centers without fasteners.
1. Base-Metal Thickness: Not less than 0.0346-inch (0.88-mm) (20 gauge) Thickness Designator 33.
- H. Cold-Rolled Furring Channels: 0.0538-inch (1.367-mm) (16 gauge) Thickness Designator 54 uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
1. Depth: As indicated on Drawings.
  2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated-steel thickness of 0.0329 inch (0.8 mm).
  3. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.

- I. Z-Shaped Furring: With slotted or non-slotted web, face flange of 1-1/4 inches (32 mm), wall attachment flange of 7/8 inch (22 mm), minimum uncoated-metal thickness of 0.018 inch (0.45 mm) (25 gauge) Thickness Designator 18.
- J. Utility Angles: Sheet steel, sized for condition and application, matching framing, designed for corners.
- K. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Basis of Design: ClarkDietrich Building Systems LLC.
    - a. Framing: Comply with ICC ES ESR-1166P.
    - b. Embossed Products: Comply with ICC ES AC86.
  - 2. Cemco (California Expanded Metal Products Company).
    - a. Framing: Comply with ICC ES ESR-3016.
    - b. Knurled and Ribbed Products: Comply with ICC ES ESR-2620.
  - 3. Craco Manufacturing, Inc.
    - a. Framing: Comply with ICC ES ESR-3943 or ESR-3957P.
  - 4. Custom Stud, Inc.
    - a. Framing: Comply with ICC ES ESR-4024.
  - 5. Marino\Ware; Div. of Ware Industries, Inc.
    - a. Framing: Comply with ICC ES ESR-4062.
    - b. Knurled and Ribbed Products: Comply with ICC ES ESR-2620.
  - 6. SCAFCO Steel Stud Company; SCAFCO Corporation/Supreme Steel Framing Association.
    - a. Comply with ICC ES ESR-3064P.
  - 7. Steel Construction Systems.
    - a. Framing: Comply with ICC ES ESR-3064P.
  - 8. Super Stud Building Products, Inc.
  - 9. Telling Industries.
    - a. Framing: Comply with ICC ES ESR-2281.
    - b. Knurled and Ribbed Products: Comply with ICC ES ESR-2620.

### 2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, not less than 0.1055-inch- (2.7-mm-) (12 gauge) diameter wire.
- B. Hanger Attachments to Concrete:
  - 1. Power-Actuated Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
  - 2. Powder-Actuated Ceiling Clip Assemblies: Corrosion-resistant; per ASTM B633 of type, size, holding power, and other properties required to withstand loading without exceeding allowable design stresses.
    - a. Ceiling Clips: Not less than 0.0897-inch (13 gauge) (2.28 mm) steel clips.
    - b. Wire Hangers: ASTM A641/A641M, Class 1 zinc coated wire hangers, soft temper; not less than 0.1055-inch- (2.7-mm-) (12 gauge) diameter wire.
  - 3. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Basis of Design Ceiling Clip Assemblies: X-CC27 U27 Series; Hilti Corporation.
      - 1) Comply with ICC ES ESR-2184.
    - b. Basis of Design Ceiling Wire Assemblies: X-CW Series; Hilti Corporation.
      - 1) Comply with ICC ES ESR-2892.
    - c. Basis of Design Rod Hanger: X-HS Series; X-HS MX Series; Hilti Corporation.
      - 1) Comply with ICC ES ESR-2795.
- C. Wire Hangers: ASTM A641/A641M, Class 1 zinc coating, soft temper, , not less than 0.1055-inch- (2.7-mm-) (12 gauge) diameter wire.
  - 1. Bracing and lateral tie wire not less than 0.1483-inch (9 gauge) (3.8-mm-) diameter wire.

- D. Flat Hangers: Steel sheet, not less than 1 inch by 3/16-inch (25 by 5 mm), by length required.
- E. Carrying Channels (Main Runners): Cold-rolled, commercial-steel sheet with a base-steel thickness of 0.0538-inch (1.367-mm) (16 gauge) Thickness Designator 54 and minimum 1/2-inch- (13-mm-) wide flanges.
  - 1. Depth: 1-1/2 inches (38 mm).
- F. Tie Channel Clips: Clips for us to connect furring channel to carry channel; minimum 0.1055-inch- (2.7-mm-) (12 gauge) diameter wire.
- G. Furring Channels (Furring Members):
  - 1. Cold-Rolled Channels: 0.0538-inch (1.367-mm) Thickness Designator 54 uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges, 3/4 inch (19 mm) deep.
  - 2. Steel Studs and Tracks: ASTM C645.
    - a. Minimum Base-Steel Thickness, Vertical: 0.0179 inch (0.455 mm) Thickness Designator 18.
    - b. Minimum Base-Steel Thickness, Horizontal: 0.0296 inch (0.752 mm) Thickness Designator 30.
    - c. Depth: 3-5/8 inches (92 mm) unless otherwise indicated.
  - 3. Hat-Shaped, Rigid Furring Channels: ASTM C645, 7/8 inch (22 mm) deep.
    - a. Minimum Base-Steel Thickness: 0.0329 inch (0.836 mm) Thickness Designator 30.
- H. Utility Angles: Sheet steel, sized for condition and application, designed for corners.
  - 1. Base-Metal Thickness: Not less than 0.018 inch (0.45 mm) (25 gauge) Thickness Designator 18.

## 2.4 GRID SUSPENSION SYSTEMS

- A. Grid Suspension System for Gypsum Board Ceilings: ASTM C635, ASTM C636/C6356M, and ASTM C645, heavy-duty; direct-hung system composed of main beams and cross-furring members that interlock; with not less than 1-3/8-inch (35 mm) wide knurled capped flange face; able to withstand design loads indicated within deflection and lateral limitations; with accessories.
  - 1. Wall Channel: Track channel with not less than 1-3/8-inch (35 mm) wide capped flange face.
  - 2. Products: Subject to compliance with requirements, provide one of the following:
    - a. Drywall Grid Systems; Armstrong World Industries, Inc.; Worthington Armstrong Venture (WAVE).
      - 1) Comply with ICC ES ESR-1289; ICC ES ESR 2311 for short span systems.
    - b. 8900 Series Ceiling Suspension System; Shortspan Drywall Grid System (DGS); Armstrong Shortspan Drywall Framing System S7714HRC; Worthington Armstrong Venture (WAVE).
      - 1) Comply with ICC ES ESR-1289.
    - c. ROCKFON Ceiling Suspension System; ROXUL USA, Inc.
      - 1) Comply with ICC ES ESR-2631.
    - d. Donn Ceiling Suspension System; USG Corporation.
      - 1) Comply with ICC ES ESR-1222.
    - e. No substitutions permitted.

## 2.5 PROPRIETARY RECESSED STANDARDS

- A. Proprietary Recessed Standards: Proprietary recessed slotted standard components, fully-recessed, of lengths indicated; with slot spacing and size indicated and confirmed with Owner; for direct attachment to non-structural metal framing studs.
  - 1. Types, Lengths, and Other Characteristics: As indicated in Drawings.
    - a. Comply with ICC ES ESR 3368 for Clemco Elite Standard Systems.

2. Manufacturer: As indicated in Drawings.

## 2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with installation standards indicated.
- B. Steel Drill Screws: ASTM C1513 and according to Section E4 of AISI S100.
  1. Use screws complying with ASTM C954 for fastening to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
  2. Use screws complying with ASTM C1513 for fastening to steel members with a thickness not greater than 0.118 inches (2.99 mm).
  3. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not limited to the following:
    - a. PFTH SD Framer Series, PPCH SD Framer Series, PPFH SD Framer Series, PPH Self-Drilling Series, PTH SD Framer Series; Hilti Inc.
      - 1) Comply with ICC ES ESR-2196.
    - b. Grabber Drivall; Grabber Superdrive Self-Drilling Tapping Screws.
      - 1) Comply with ICC ES ESR-1271.
    - c. ITW Buildex Teks Select Undercut PFH; ITW Buildex.
- C. Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on framing without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.
  1. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E1190 conducted by a qualified testing agency.
  2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not limited to the following:
    - a. Basis of Design Fasteners: X-U Series; X-U 15 Series; X-P Series; EDS Series; DS Series; X-C Series; X-CR Series; X-R Series; Hilti Corporation.
      - 1) X-U, X-U 15, X-P Series: Comply with ICC ESR-2269.
      - 2) EDS, DS, X-C, X-CR, X-R Series: Comply with ICC ES ESR-1663.
    - b. Fasteners: ITW Ramset.
      - 1) Comply with ICC ES ESR-1799.
    - c. Basis of Design Track Fasteners: X-U Series; X-U 15 Series; EDS Series; X-C20 THP; X-C22 P8TH; Hilti Corporation.
      - 1) X-U, X-U 15 Series: Comply with ICC ES ESR-1752.
      - 2) EDS Series; X-C20 THP; X-C22 P8TH: Comply with ICC ES ESR-1663.
    - d. Track Fasteners: Trakfast Fasteners; ITW Ramset.
      - 1) Comply with ICC ES ESR-2579.
    - e. Basis of Design Threaded Stud Fasteners: X-W6 Series; W10 Series; Hilti Corporation.
      - 1) Comply with ICC ES ESR-1663.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine areas and substrates, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.



- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 INSTALLATION, GENERAL

- A. General: ASTM C754, ASTM C840, SFIA "Tech Note 1," SSMA "Product Technical Guide," and manufacturer's written installation requirements, suitable to Project conditions.

### 3.3 INSTALLING FRAMED ASSEMBLIES

- A. General: Install framing system components according to requirements indicated and codes and standards in effect. Provide components spaced as follows:
  - 1. Single-Layer Application, Partitions: 16 inches (406 mm) on center with panel parallel or perpendicular to framing, unless otherwise indicated.
  - 2. Single-Layer Application, Ceilings: 16 inches (406 mm) on center with panel parallel to framing; 24 inches (610 mm) on center with panel perpendicular to framing unless otherwise indicated; not more than 24 inches (610 mm) on center at grid suspension systems.
- B. Fastening: Attach using appropriate fasteners for conditions, selected for holding power and loads anticipated on framing system components.
  - 1. Do not use friction clips for anchorage attachment.
  - 2. Drive screw fasteners to extend through steel connection a minimum of 3 exposed threads.
  - 3. Stripped screws in direct tensions are considered defective.
  - 4. Stripped screw fasteners in shear are only considered effective when the number of stripped screw fasteners considered effective does not exceed 25 percent of the total number of screws considered effective.
  - 5. For screw fasteners in steel-to-steel connections, minimum center-to-center spacing and edge distances shall be not less than 3 times the nominal screw diameter. Where the edge is parallel to the direction of applied force, the minimum edge distance of screw fasteners shall be not less than 1.5 times nominal diameter. Where the center-to-center spacing is 2 times the nominal diameter or less, screw fasteners are considered no greater than 80 percent of effective.
- C. Powder-Actuated Fastening to Substrates: Attach framing using appropriate powder-actuated fasteners for conditions, selected for holding power and loads anticipated on framing system components.
  - 1. Apply powder-actuated fasteners to concrete substrates or structure at rate and location per manufacturer's recommendations and requirements, but not less than 1 fastener per 24 inches (610 mm) at tracks and sill tracks, unless otherwise indicated.
  - 2. Embedment: Not less than 1-1/4 inches (32 mm).
  - 3. Do not use for tension load applications unless approved for such loading.
- D. Orientation of Framing: Install studs so flanges within framing system point in same direction.
- E. Framing to Structure: Install tracks (runners) at floors and overhead supports. Extend framing full height except where indicated. Continue framing over doors and openings, and around ducts and other items penetrating partitions, including above ceilings.
  - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
  - 2. Door Openings: Frame door openings to comply with details indicated and with manufacturer's written recommendations, to meet loading conditions.
    - a. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud. Extend jamb studs to underside of overhead structure.

3. Suspended Ductwork: Do not frame into or fasten framing to ductwork. Install continuous metal header and stiffen framing across length of opening below duct; install full height framing each end of opening. Install additional framed bracing at each end.
  - a. Install framing of not less than 0.0346-inch (0.88-mm) (20 gauge) Thickness Designator 33 (structural) at stiffened framing unless thicker materials are required by conditions.
- F. Bridging: Install continuous internal bridging within framing systems according to ASTM C754, SFIA "Tech Note 1," SSMA publications, and manufacturer's recommendations.
  1. Composite Full Height Walls: No bridging required.
  2. Non-Composite Fully Braced Walls: Bridging spaced not greater than 48-inches (1219 mm) above the top of the lowest gypsum board on either side of partition or wall.
  3. Non-Composite Unbraced Walls: Bridging spaced not greater than 48-inches (1219 mm) above the top of the lowest gypsum board on either side of partition or wall.
- G. Seismic Restraint: Install to comply with ASTM C636/C636M, ASTM C754, ASTM C840, codes in effect, and authorities having jurisdiction. Brace framing to building structure to resist and restrain seismic forces. Isolate seismic forces of partitions from acoustical panel ceilings and suspension systems for gypsum board ceilings.
  1. Install connections for seismic restraint in a manner to develop maximum connection strength, resistance to seismic forces, and other characteristics.
  2. Where bracing occurs within 6 inches (150 mm) of stud punch openings, reinforce stud at punch opening with additional sheet steel not less than the thickness of the stud member.
  3. Limit hanger rods to 12 inches (300 mm) or less unless otherwise indicated.
  4. Install partition and ceiling, soffit, and bulkhead framing with not less than 3/8-inch (9.5 mm) clearance to sprinkler piping, heads, and other penetrations.
- H. Framing Supports for Others: Provide supplemental framing for attachment and support of work of other trades and disciplines. Install strapping, metal backing plates, or special metal shapes as required, securely fastened to framing.
- I. Modifications: Modify, reinforce, and install new framing members, bridging, and accessories within existing non-structural metal framing as required to comply with performance requirements. Cut members squarely, true to line and elevation required. Avoid twist, warp, or undue stress to framing.
- J. Tolerances: Install with fastening flanges more than 1/8-inch (3 mm) cumulative from other flanges.

### 3.4 INSTALLING SUSPENSION SYSTEMS

- A. General: Install suspension system components including framing for soffits and bulkheads according to ASTM C754, ASTM C840, manufacturers written installation instructions, and codes and standards in effect. Frame ceilings to limit maximum unsupported gypsum board to 24 inches by 48 inches (610 mm by 1219 mm).
  1. Hangers: Not more than 48 inches (1219 mm) on center.
  2. Main Tees: Not more than 48 inches (1219 mm) on center.
  3. Cross Members: Not more than 24 inches (610 mm) on center.
  4. Frame ceilings to limit maximum unsupported gypsum board to 24 inches by 48 inches (610 mm by 1219 mm) except at areas containing lights and other penetrations.
  5. Frame ceilings to limit maximum unsupported gypsum board to 24 inches by 24 inches (610 mm by 610 mm) at areas containing lights and other penetrations.
- B. Hanging: Size and install hangers and connections from building structure to comply with performance requirements, plumb and free from contact with objects that are not part of structure or suspension system. Secure hanger wires to suspension members and supports with a minimum of 3 tight turns.
  1. Install hanger wires within 12 inches (300 mm) each side of each pivoted splice clip.

2. Install hanger wires within 12 inches (300 mm) of each transition clip.
  3. Splay hangers only where required to miss obstructions.
- C. Grid Suspension Systems: Install to comply with ASTM C636/C636M, ASTM C754, codes and standards in effect, authorities having jurisdiction, and manufacturer's written instructions. Mechanically fasten and positively lock mains, tees and members.
- D. Seismic Restraint: Install to comply with ASTM C636/C636M, ASTM C754, and ASTM C841, codes in effect, and authorities having jurisdiction.
1. Install connections for seismic restraint to develop maximum connection strength and resistance to seismic forces.
  2. Install steel brace framing, cross bracing, framing struts, sway-braced framing, rod, flat or angle struts, compression struts, or a combination of these.
- E. Installation Tolerances: Install suspension systems that are level to within 1/8-inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.
1. For wire hangers, splay of wires not to exceed 1 in 6 plumb.

### 3.5 PENETRATIONS OF CEILINGS

- A. General: Provide supplementary framing around penetrations in ceilings, soffits, and bulkheads, including those for light fixtures, diffusers, grilles, ceiling-mounted devices, and other ceiling-mounted items.
1. Frame ceilings and suspension systems independent of walls and partitions.
  2. Install supplemental framing to accept brackets and attachment of fixtures or air terminal devices.
  3. Install light fixtures not required to be independently supported with mechanical attachment to grid with not less than two attachment points per fixture.
  4. Independently support light fixtures weighing more than 20 lbs. (9.1 kg).
  5. Attach air terminal devices weighing less than or equal to 20 lbs. (9.1 kg) to ceiling suspension system using clips, brackets, or other form of positive attachment.
  6. Attach air terminal devices weighing more than 20 lbs. (9.1 kg) and hung from structure to ceiling suspension system using clips, brackets, or other form of positive attachment.
  7. Install supplemental framing to support lighting fixtures where fixtures or diffusers are supported from framing, in addition to any independent hangers.

### 3.6 PROPRIETARY RECESSED STANDARD ASSEMBLIES

- A. General: Install proprietary recessed slotted standard assemblies of type, kind, and of heights indicated in Drawings. Accurately locate bottom of recessed slotted standards at heights above finished flooring. Install standards of lengths indicated. Fix standards at locations and heights indicated. Comply with manufacturers written installation instructions.
1. Install supplementary stud framing and other framing required for standards.
  2. Comply with ICC ES ESR installation requirements.
- B. Fastening: Screw-fasten and fix assemblies to metal framing. Install using fasteners suited and appropriate to metal framing, of type required per manufacturer. Secure flanges of integral stud assemblies to steel tracks and runners with not less than 1 screw fastener at each flange front and back, top of bottom of assembly studs.

### 3.7 CLEANING

- A. General: Remove any excess materials or residue from interior framed cavities.



3.8 PROTECTION

- A. Final Protections: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure non-structural metal framing is without damage and deterioration at the time of Substantial Completion/Final Acceptance.

END OF SECTION 09 22 16.42

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Interior gypsum board.
  - 2. Trim, auxiliary materials, and accessories.
  - 3. Installation and finishing, including finishing at recessed standards.
  - 4. Repairs and transitions to existing surfaces.

1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect and authorities having jurisdiction including the following; where requirements conflict, comply with the most stringent provisions.
  - 1. Division 01 Section "Codes and Standards."
  - 2. Gypsum Association (GA), including:
    - a. GA-214 "Recommended Levels of Gypsum Board."
      - 1) GA-214M "Recommended Levels of Gypsum Board-Matrix."
    - b. GA-216 "Application and Finishing of Gypsum Panel Products."
    - c. GA-220 "Gypsum Board Winter Related Installation Recommendations."
    - d. GA-223 "Gypsum Panel Products Types, Uses, Sizes, and Standards."
    - e. GA-229 "Shear Values for Screw Application for Gypsum Board on Walls."
    - f. GA-235 "Gypsum Board Mechanical and Physical Properties."
    - g. GA-238 "Guidelines for Prevention of Mold Growth on Gypsum Board."
  - 3. Other Standards: Comply with additional standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM).

1.4 DELIVERY, STORAGE AND HANDLING

- A. General: In addition to requirements of Division 01 Sections, store materials inside under cover and keep them dry and protected against weather, excess moisture and humidity, and other damage.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Wetted Products: Do not install panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## PART 2 - PRODUCTS

### 2.1 SOURCE LIMITATIONS

- A. General: Obtain each type of gypsum panel and joint finishing material from single source with resources to provide products of consistent quality in appearance and physical properties.

### 2.2 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

### 2.3 INTERIOR GYPSUM BOARD

- A. Gypsum Wallboard: ASTM C1396/C1396M.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Georgia-Pacific Gypsum LLC.
    - b. National Gypsum Company.
    - c. USG Corporation.
    - d. No substitutions permitted.
  2. Thickness: 5/8-inch (15.9 mm) unless otherwise indicated.
  3. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
- B. Gypsum Ceiling Board: ASTM C1396/C1396M.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Georgia-Pacific Gypsum LLC.
    - b. National Gypsum Company.
    - c. USG Corporation.
    - d. No substitutions permitted.
  2. Thickness: 5/8-inch (15.9 mm) unless otherwise indicated.
  3. Long Edges: Tapered.
- C. Abuse-Resistant Gypsum Board: ASTM C1396/C1396M gypsum board, tested according to ASTM C1629/C1629M.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Georgia-Pacific Gypsum LLC.
    - b. National Gypsum Company.
    - c. USG Corporation.
    - d. No substitutions permitted.
  2. Core: 5/8-inch (15.9 mm).
  3. Surface Abrasion, Indentation, and Soft-Body Impact: meets or exceeds Level 1.
  4. Long Edges: Tapered.
  5. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

## 2.4 SPECIALTY GYPSUM BOARD

- A. Glass-Mat Interior Gypsum Board: ASTM C1658/C1658M. With fiberglass mat laminated to both sides. Specifically designed for interior use.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Georgia-Pacific Gypsum LLC.
    - b. National Gypsum Company.
    - c. USG Corporation.
    - d. No substitutions permitted.
  - 2. Core: 5/8 inch (15.9 mm).
  - 3. Long Edges: Tapered.
  - 4. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

## 2.5 TRIM ACCESSORIES

- A. Interior Trim: ASTM C1047.
  - 1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
    - a. Plastic and paper-faced products are not permitted.

## 2.6 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475/C475M.
- B. Joint Tape:
  - 1. Interior Gypsum Board: Paper or pressure-sensitive, open weave glass-mesh reinforcing tape, 10-by-10 glass mesh.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
  - 1. Use setting-type taping compound only for prefilling and embedding and first coat. Do not use for fill or finishing coats.

## 2.7 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
  - 1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.



1. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 INSTALLATION AND FINISHING OF PANELS, GENERAL

- A. General: Comply with ASTM C840, GA-216, GA-223, codes and standards in effect, and manufacturer's written installation instructions.
- B. Soffits, Bulkheads, and Ceilings: Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Panel Joints: Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16-inch (1.5 mm) of open space between panels. Do not force into place.
- D. Edge and End Joints: Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Control and Expansion Joints: Form control and expansion joints with space between edges of adjoining gypsum panels. Comply with ASTM C840.
  1. Layout control joints in unbroken spans of gypsum board at intervals not greater than 60 feet (18.3 m) in any direction.
- F. Full-Height Construction: Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings and in similar conditions), except where otherwise indicated.
  1. Coverage at concealed conditions may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
  2. Fit gypsum panels around ducts, pipes, and conduits.
  3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members.
- G. Perimeter Conditions: Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. Fitting Panels at Recessed Standards: Apply gypsum panels vertically in areas containing proprietary recessed slotted standard assemblies. Cut, rout or slot gypsum panels accurately for proper fit to standard flanges; avoid large gaps between board and flange. Do not install panels horizontally.

### 3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

- A. General: Install interior gypsum board in the following locations:
  1. Wallboard Type: Vertical surfaces unless otherwise indicated.

2. Ceiling Type: Ceiling, soffit, and overhead bulkhead surfaces.
3. Abuse-Resistant Type: Vertical surfaces of interior freestanding column enclosure and corridors, and as indicated.
4. Glass-Mat Interior Type: Interior applications at interior faces of exterior wall surfaces or at conditions in lieu of other gypsum board where gypsum board is otherwise potentially susceptible to moisture, water or wetting, or excess humidity, and where indicated.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels either vertically (parallel to framing) or horizontally (perpendicular to framing) unless otherwise indicated, to minimize end joints.
  - a. Install boards vertical with tapered joints over studs at all proprietary recessed standard installations. Do not install and seam horizontally at or below recessed standards.
3. Stagger abutting end joints not less than one framing member in alternate courses of panels.

C. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

### 3.4 INSTALLATION OF TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

1. Install screw fasteners or adhesive or a combination of these in addition to stapling corner bead trim.

B. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Owner for visual effect.

C. Interior Trim: Install in interior locations and where indicated; install trim at all corners and edges otherwise exposed.

### 3.5 FINISHING OF GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

1. Finish surfaces exposed to view according to levels indicated and to achieve consistent and uniform planes and surfaces, finish free of marks, ridges, telegraphing of joint locations, or other irregularities. Comply with additional requirements of ASTM C840, GA-214 and GA-214M matrix, and GA-216.

B. Prefilling: Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Taping: Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:

1. Level 3: Where indicated on Drawings and the following:
  - a. All interior vertical gypsum board surfaces inside Center unless otherwise indicated.
  - b. Interior face of exterior wall construction not otherwise exposed to the Sales floor.
2. Level 4: Where indicated on Drawings, at panel surfaces that will be exposed to view unless otherwise indicated, and the following:
  - a. All surfaces facing the Sales floor.

- b. All surfaces to receive flat painted finishes including ceilings.
  - c. All surfaces in which recessed standards occur, unless a Level 5 is required.
  - d. All surfaces behind perimeter fixturing, millwork, running and similar trim, and casework and display fixtures, unless otherwise indicated.
  - e. All ceilings, ceiling bulkheads, soffits, and ceiling transitions, unless a Level 5 is required.
  - f. Primer and its application to surfaces are specified in Division 09 Section "Interior Painting."
3. Level 5: Where indicated on Drawings and where a higher level of finish is required.
- a. Ceiling surfaces where required to produce flat ceilings without joint telegraphing.
  - b. Surfaces surrounding recessed standards where required to produce flat, uniform planes.
  - c. Surfaces around linear and other diffusers, grilles, and terminal air devices.
  - d. Surfaces around access panels.
  - e. All surfaces of repairs.
  - f. Primer and its application to surfaces are specified in Division 09 Section "Interior Painting."
- E. Finishing at Recessed Standards: Finish surfaces surrounding perimeter of installed standards to achieve consistent, uniform planes and surfaces including surfaces above and below standards.
- 1. Remove any protective slot covers only after completion of finishing operations. Remove any excess joint compounds from standard surfaces.

### 3.6 PATCHING AND TRANSITIONS

- A. General: Patch and repair existing gypsum board panels, and plaster if present, for those surfaces damaged or disturbed and remaining in the finished Work.
- 1. Produce durable, permanent repairs.
  - 2. Finish surfaces to achieve uniform and consistent surfaces free of cracks, telegraphing of joints between existing and new work, dents, dimples, gouges, grooves, rough paper texture, scratches, tool marks, irregularities, or other evidence of patching and repair, when viewed from a distance of 36 inches (0.91 m) under final lighting conditions or its equivalent, without magnification.
  - 3. Patch and repair existing walls/partitions and ceilings where devices, boxes, fixtures, lighting, equipment, and other items have been removed or demolished, where the Work has damaged walls/partitions and ceilings, where existing surfaces are exposed in the permanent, final Work, and at locations indicated in Drawings.
- B. Preparation: Remove areas of damaged panels.
- 1. Remove wall- or ceiling- mounted equipment, devices, fixtures, lighting or other items before repairs.
  - 2. Cover boxes, duct openings and similar penetrations to control the spread of dust.
  - 3. Remove areas of gypsum board where paper surfaces have delaminated or are otherwise damaged.
  - 4. For areas of flaking or powdery surfaces, clean and remove flaking and powder to reach sound substrates. Neutralize with primers, bonding agents, or other products to produce sound surfaces ready for repairs.
- C. Existing Surfaces: Repair with durable seams and finish to align to match surrounding undisturbed surfaces. Comply with GA-225 for repairs to fire-rated gypsum board.
- 1. Where damage is minor, install expanded metal mesh or open-weave glass-fiber mesh as a substrate for fill. Fill with setting-type or drying type compounds.
  - 2. Completely fill holes and depressions in existing surfaces to remain. Use setting-type or drying-type compounds or a combination of these according to manufacturer's instructions.
    - a. Use expanded metal mesh, open-weave glass-fiber mesh, or other materials where required to fill holes.
  - 3. Where required, pre-moisten joints or areas of repairs before applying joint compounds.
  - 4. Where required, press initial fill into joints and cracks to promote full bond and keying (attachment) of fill into joint.

5. Where repairs or damage exceeds minor repairs or damage, or where repair will otherwise affect finish, structure, fire-resistance, or performance of gypsum panel, cut out and replace panels. Size replacement panel to align joints over framing or other supporting substrate.
  - a. Fit gypsum board cut to closely fit opening and screw into place.
6. For smaller patches, finish to Level 5 finish. For areas exceeding 30 inches (762 mm) square, finish transitions to Level 4 or Level 5.
7. Transition planes and surfaces of existing to new work to produce consistent and uniform planes and surfaces, free of marks, ridges, telegraphing of joint locations, or other irregularities.
  - a. Finish repairs and transitions to not less than Level 4, or where required to achieve consistency and uniformity, Level 5 finish.

### 3.7 REPAIRS

- A. General: Repair surfaces to produce uniform, consistent finished surfaces without evidence of repair.
- B. Touch-Up: Touch-up all gypsum board surfaces such that at time of Substantial Completion/Final Acceptance all surfaces are without damage or deterioration.
  1. Touch-up gypsum board as many times as required.
- C. Wetted Products: Remove and replace panels that are wet, moisture damaged, and mold damaged.
  1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

### 3.8 CLEANING

- A. Residual Materials: Promptly remove any residual joint compounds from adjacent surfaces.

### 3.9 PROTECTION

- A. General: Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
  1. Protect installed products from excess water and humidity, and other damage for remainder of the construction period.
- B. Final Protection: Provide final protection and maintain conditions that ensure gypsum board is without damage or deterioration at the time of Preliminary Acceptance/Substantial Completion.

END OF SECTION 09 29 00

## SECTION 09 30 00 - FLOOR PREPARATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Preparations of surfaces and substrates for flooring or floor coverings including:
    - a. Shot blasting (blast track).
    - b. Abrasive scraping/grinding.
    - c. Wet grinding.
    - d. Liquid cleaners.
    - e. Cementitious leveling compounds and underlayment.

#### 1.3 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install products until conditions are maintained at the levels indicated in manufacturer's written instructions and standards in effect.

#### 1.4 COORDINATION

- A. General: Coordinate floor preparation requirements with specific flooring materials and floor covering manufacturer's requirements for substrates and conditions, and with work of other Sections.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Preparation: Prepare existing substrates to produce suitable surfaces that are dry, sound, durable, and level, of composition and finish or texture to promote adhesion for permanent finished flooring materials and coverings, compatible with coating, adhesives, and subsequent flooring, with preparations acceptable to manufacturers of finish flooring products.

#### 2.2 CEMENTITIOUS UNDERLAYMENT

- A. Self-Leveling Cementitious Underlayment: Latex-modified, portland cement-based; self-leveling, fast setting, non-shrink; water-resistant; compatible with flooring adhesives and setting compounds; designed for applications from feathered edges to 1-1/2 inches (38 mm) thick without the need for added aggregate; maximum single layer of 1/2-inch (13 mm) thick.

1. Cement Binder: ASTM C 150, portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C219.
  2. Compressive Strength: Not less than 4,100 psi (288 k/m<sup>2</sup>) at 28 days when tested according to ASTM C109/C109M.
  3. Flexural Strength: Minimum 1,200 psi (84 k/sq. m) after 28 days.
  4. Products: Subject to compliance with requirements, provide the following:
    - a. Basis of Design: Ardex K-15 Premium Self -Leveling Underlayment; Ardex Engineered Cements; Div. of Ardex LP.
    - b. Mapei Ultraplan M20; Mapei Ultraplan M20 Plus; MAPEI Corporation.
    - c. No substitutions permitted.
- B. Self-Drying Cementitious Underlayment: Latex-modified, portland cement-based; fast setting, non-shrink, self-drying; trowel-applied; water-resistant; compatible with flooring adhesives and setting compounds; designed for applications from feathered edges to 1/2-inch (13-mm) thick; approved by manufacturer of tile-setting materials for installations indicated; for use with or without self-leveling cementitious underlayment.
1. Products: Subject to compliance with requirements, provide the following:
    - a. Basis of Design: Ardex Feather Finish; Ardex Engineered Cements; Div. of Ardex LP.
      - 1) Basis of Design Primer: Ardex P51 Primer; Ardex P 82 Ultra Prime; Ardex P 82; as suited for condition, substrate, and application; Ardex Engineered Cements; Div. of Ardex LP.
    - b. No substitutions permitted.
- C. Water: Potable and at temperature of not more than 70 deg F (21.1 deg C).
- D. Primers and Sealers: Manufacturer's recommended products.

### 2.3 CLEANERS

- A. Chemical Cleaners and Removers: Manufacturer's standard cleaners, suitable for conditions; compatible with flooring adhesives, setting products and other materials intended for flooring applications.
1. Provide materials with VOCs to comply with codes and standards in effect.

### 2.4 MIXING CEMENTITIOUS MATERIALS

- A. Mixing: Mix cementitious materials to comply with standards and manufacturers' written instructions. Add materials, water, and additives in accurate proportions of uniform quality with optimum performance characteristics for installation.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine substrates, areas, and conditions, with Installer present, for compliance with installation requirements.
1. Verify that concrete substrates comply with ASTM F710 and where applicable, ANSI A108.01. Measure moisture vapor emission rate per ASTM F1869 and where required, ASTM F2170.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.

- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 PREPARATION, GENERAL

- A. General: Comply with manufacturer's installation requirements to prepare and clean substrates to receive work of other Sections.
  - 1. Leave substrates clean, free of excessive cracking, depressions, and prepared for subsequent flooring installation in accordance with manufacturer of flooring.
- B. Concrete Substrates: Remove laitance, form-release agents, residual chemically-dissipating, or other compounds, dust, dirt, grease, oil, paints, and other contaminants that might impair bond.
  - 1. Treat nonmoving substrate cracks to prevent cracks from telegraphing (reflecting) through underlayment according to manufacturer's written recommendations.
  - 2. Comply with individual Division 09 Sections for flooring and floor coverings.
- C. Curing: Allow time for curing, bonding, drying, and other operations without delaying the Work.

### 3.3 SHOT BLASTING

- A. General: Select and use shot blasting equipment that is appropriate for conditions and will produce properly prepared substrates and surfaces. Shot blast substrates and surfaces where stone tiling is planned.
  - 1. Abrasive blast clean concrete surfaces uniformly to expose top surface of fine aggregate according to ASTM D4259.
  - 2. Control shot blasting to avoid opening cracks beyond 1/16-inch (1.5 mm) in depth or width.
  - 3. Remove remaining loose material and clean surfaces according to ASTM D4258.

### 3.4 ABRASIVE GRINDING, SCRAPING, AND CONCRETE GRINDING

- A. Abrasive Grinding/Abrasive Scraping/Concrete Grinding: Select and use manual or powered grinding and scraping equipment that is appropriate for conditions and will produce properly prepared substrates and surfaces. Use tools with abrasive or carbide removal media or teeth to produce prepared surfaces.
  - 1. Remove remaining loose material and clean surfaces according to ASTM D4258.
  - 2. Limit abrasive and concrete grinding to not more than 1/4-inch (6.35 mm) anywhere in the elevated concrete floor substrate.

### 3.5 WET GRINDING

- A. Wet Grinding: Select and use manual or powered grinding and scraping equipment that is appropriate for conditions and will achieve properly prepared substrates. Control water application for wet grinding, resulting slurry, and discharges of waste materials. Apply water sparingly; avoid allowing water to spread beyond area, or infiltrate or flood facility.
  - 1. Remove remaining loose material and clean surfaces according to ASTM D4258.
  - 2. Limit wet grinding to not more than 1/4-inch (6.35 mm) anywhere in the elevated concrete floor substrate.

3.6 CHEMICAL CLEANERS

- A. Chemical Cleaners: Select and apply chemical cleaners at rates and under conditions per manufacturer's recommendations and written instructions. Remove coatings and other substances that are incompatible with adhesives or other compounds.
  - 1. Remove remaining loose material and clean surfaces according to ASTM D 4258.

3.7 INSTALLATION OF CEMENTITIOUS UNDERLAYMENT

- A. General: Apply cementitious underlayments to comply with manufacturers written instructions to produce a finish substrate suitable for direct flooring material application.
  - 1. Apply in layers not thicker in a single application than is permitted by manufacturer.
  - 2. Prepare surfaces to promote optimum underlayment-to-substrate bonding and adhesion.
    - a. Where required, use and apply primers according at manufacturer's recommended rates for conditions.
  - 3. Feather edges to match adjacent floor elevations.
  - 4. Allow underlayment to cure according to manufacturer's written instructions.
- B. Surface Deviations: Not greater than 1/8-inch in 10 feet (3 mm in 3.0 m) fall or rise in any direction in final prepared substrates and surfaces.
- C. Transitions: Fall or rise not to exceed 1/8-inch in 3 feet (3 mm in 0.91 m) in final prepared substrates and surfaces.
- D. Sloping and Ramping: Apply and feather cementitious underlayment until substrate is at proper elevation for finished floor coverings. Where fill exceeds manufacturer's recommended single layer thickness or otherwise required, apply in layers and allow drying or curing before applying additional underlayment.
  - 1. Do not exceed slope or ramp of 1/8-inch in 3 feet (3 mm in 0.91 m) in final prepared substrates and surfaces.

END OF SECTION 09 30 00



## SECTION 09 31 00 - TILING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Modular floor tiling, including field and base.
  - 2. Crack isolation membrane.
  - 3. Accessories.
  - 4. Preparation of substrates to receive tile.
  - 5. Fabrication of tiling.
  - 6. Setting tile, including thin-set and medium bed mortars.
  - 7. Cleaning, grouting and sealing.

#### 1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect including:
  - 1. Division 01 Section "Codes and Standards."
  - 2. Tile Council of North America Inc. (TCNA) including:
    - a. TCNA "Handbook for Ceramic, Glass, and Stone Tile Installation," 2014 edition.
    - b. TCNA "EJ171 Movement Joint Guidelines for Ceramic, Glass, and Stone" Methods EJ171-14 and EJ171C-14 through EJ171J-14," 2014 edition.
    - c. TCNA "Additional Products Used in Tile Installations."
    - d. TCNA "Field and Installation Requirements."
    - e. TCNA "Floor Tiling Installation Guide."
    - f. TCNA "Natural Stone Tile Selection and Installation Guide."
  - 3. Natural Stone Institute (NSI), including:
    - a. NSI's "Dimensional Stone Design Manual."
  - 4. Other Standards: Comply with additional standards indicated. Refer to individual publishers or sources of standards for original documents, including American National Standards Institute (ANSI) and American Society of Testing and Materials (ASTM).

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility: Provide tiling to comply with codes and standards in effect.
  - 1. Static Coefficient of Friction, Installed: Less than 0.6 dry COF for flat and level surfaces; less than 0.8 dry COF for inclined or ramped surfaces.
- B. Load-Bearing Performance Level: For floor tile, ASTM C627, Heavy (Commercial): Passes cycles 1 through 12.

- C. Abrasion Resistance: For floor tile, value of not less than 10, per ASTM C1353 or ASTM C241.
- D. Compatibility: Provide products and accessories compatible with Project conditions and substrates.

## 2.2 CRACK ISOLATION MEMBRANE

- A. General: ANSI A118.12 for high performance, and as recommended by the manufacturer for application; manufacturer's standard product selected from the following, indicated. Include reinforcement and accessories recommended by manufacturer. Select from one of the following types.
- B. Basis of Design Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and fabric reinforcement.
  - 1. Manufacturer: Subject to compliance with requirements, provide one of the following:
    - a. Basis of Design: Laticrete Blue 92 Anti-Fracture Membrane with Laticrete Blue 92 Anti-Fracture Membrane Liquid.
    - b. Mapelastic AquaDefense with MAPEI Reinforcing Fabric; MAPEI Corporation.
    - c. No substitutions permitted.
- C. Chlorinated Polyethylene Sheet: Nonplasticized, chlorinated polyethylene faced on both sides with nonwoven polyester fabric; 0.030-inch (0.76-mm) nominal thickness.
  - 1. Manufacturer: Subject to compliance with requirements, provide the following:
    - a. Nobleseal CIS; Noble Company (The).
    - b. No substitutions permitted.
- D. Fabric-Reinforced, Modified-Bituminous Sheet: Self-adhering, modified-bituminous sheet with fabric reinforcement facing; 0.040-inch (1.01-mm) nominal thickness.
  - 1. Manufacturer: Subject to compliance with requirements, provide the following:
    - a. Strataflex; National Applied Construction Products, Inc.
    - b. No substitutions permitted.
- E. Fabric-Reinforced Elastomeric Membrane Product: Self-adhering, elastomeric sheet bonded with woven reinforcement facing; 0.040-inch (1.01 mm) nominal thickness.
  - 1. Manufacturer: Subject to compliance with requirements, provide the following:
    - a. National Applied Construction Products, Inc.; ECB Anti-Fracture Membrane; with NAC TAC Interior Primer or NS97Wet Area Primer.
    - b. Mapeguard 2; Mapesonic SM; as suited for application; MAPEI Corporation.
    - c. No substitutions permitted.

## 2.3 SETTING MATERIALS

- A. Polymer-Modified Latex-Portland Cement Mortar (Thin Set): ANSI A118.4 and ANSI 118.11. Select from:
  - 1. Prepackaged, Dry-Mortar Mix: Containing dry, re-dispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
  - 2. Prepackaged, Dry-Mortar Mix: Combined with styrene-butadiene-rubber liquid-latex additive at Project site.
  - 3. Mortar Admixtures: To produce Extra Heavy Service rating per ASTM C627 and TCNA performance levels.
  - 4. Manufacturers: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not necessarily limited to the following:
    - a. Basis of Design: Laticrete 272 Mortar with 3701 Mortar Admix or Laticrete 255 MultiMax with 3701 Mortar Admix; Laticrete International, Inc.

- 1) Basis of Design Thin Set for Thicknesses Up to 3/4-inch (19 mm): Laticrete 255 MultiMax; Laticrete International, Inc.
  - b. MAPEI Kerabond/Keralastic System; MAPEI Corporation.
  - c. Super Flex with Xtra Flex Acrylic Additive; TEC; a subsidiary of H. B. Fuller Company.
- B. Polymer-Modified Latex-Portland Cement Mortar, (Medium Bed): ANSI A118.4 and ANSI A118.11; product approved by manufacturer for application up to 3/4-inch- (19 mm-) thick; designed as dry-set mortar for large and heavy tile. Select from:
1. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
  2. Provide prepackaged, dry-mortar mix combined with acrylic resin or styrene-butadiene-rubber liquid-latex additive at Project site.
  3. Manufacturers: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not necessarily limited to the following:
    - a. Basis of Design: Laticrete 220; Laticrete 220 Medium Bed Mortar White; 225 Multimax; with 3701 Mortar Admix; Laticrete International, Inc.
    - b. MAPEI Kerabond T/Keralastic System; UltraFlex LFT; UltraFlex LFT Rapid; Ultraflor; MAPEI Corporation.
    - c. Medium Bed Mortar; 3N1 Performance Mortar; TEC 372/373 Medium Bed Mortar; TEC; a subsidiary of H. B. Fuller Company.

## 2.4 GROUT MATERIALS

- A. Polymer-Modified Tile Grout: ANSI A118.7, as required to produce color indicated.
1. Polymer Type: Styrene-butadiene rubber in liquid-latex form for addition to prepackaged dry-grout mix.
  2. Type: Unsanded for joints 1/8 inch (3.2 mm) and narrower; sanded grout for larger joints.
  3. Grout Colors: Match existing.
  4. Manufacturers Unsanded Tile Grout: Subject to compliance with requirements, provide products by one of the following:
    - a. Basis of Design: Laticrete 1600 Series Unsanded Grout with 1776 Grout Enhancer; Laticrete International, Inc.
    - b. MAPEI Keracolor Wall Grout with Plastijoints grout additive or Ultracolor Plus; MAPEI Corporation.
    - c. TEC Unsanded Grout with Acrylic Grout Additive 869 or Acrylbond AccuColor XT Unsanded with Acrylic Grout Additive; TEC; a subsidiary of H. B. Fuller Company.

## 2.5 ELASTOMERIC SEALANTS

- A. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements of ASTM C920.
1. Colors: Match grout.

## 2.6 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic base, satin anodized aluminum exposed-edge finish to match existing.
1. Manufacturer: Subject to compliance with requirements, provide the following:
    - a. Basis of Design Edges: Schluter-Schiene AE; Schluter Systems L.P.

- b. No substitutions permitted.
- C. Aluminum Ramped Thresholds: Modular, sloped, fluted-top aluminum assemblies with closed return ends where required; slope 1:12 or shallower to comply with handicapped accessibility requirements; with beveled edges; full width of opening indicated.
  - 1. Base Metal: Aluminum.
  - 2. Width: Not less than 6 inches (152 mm).
  - 3. Manufacturer: Subject to compliance with requirements, provide the following:
    - a. Basis of Design: 657; National Guard Products, Inc.
    - b. No substitutions permitted.
- D. Aluminum Transitions: Modular, sloped, smooth finish aluminum assemblies; slope 1:12 or shallower to comply with handicapped accessibility requirements; with angle or L-shape, height to match tile and setting-bed thickness; full width of opening indicated.
  - 1. Finish: Satin anodized aluminum.
  - 2. Width: Not less than 2-1/2 inches (64 mm) or 3 inches (76 mm) suited to condition.
  - 3. Manufacturer: Subject to compliance with requirements, provide one of the following:
    - a. Schluter Reno Ramp AERP100B65; ARRP125B65; ARRP125B90; AERRP150B90; Schluter Systems L.P.
- E. Tile Cleaner: Neutral, non-acid cleaner capable of removing residue without harming tile.
- F. Grout Sealer: Manufacturer's standard product that does not change color or appearance of grout.

## 2.7 MIXING MORTARS AND GROUT

- A. General: Mix mortars and grouts to comply with manufacturers' written instructions.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
  - 1. Verify that substrates for setting tile are firm, dry, clean, free of incompatible coatings or other substances; and comply with ANSI A108.01 and ASTM F 710.
  - 2. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by tiling manufacturer.
    - a. Test according to ASTM F1869. Proceed with installation only after testing indicates substrates have moisture-vapor-emission rate of less than 3 lbs. of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours, or lower maximum rate per manufacturer, unless otherwise required.
    - b. Where required by carpeting manufacturer or conditions, perform testing per ASTM F 2170. Proceed only after testing indicates substrates measure not more than 80 percent relative humidity, unless a lower RH measure is required.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 PREPARATION

- A. General: Prepare substrates according to manufacturer's written instructions to ensure adhesion. Remove conditions and coatings detrimental to installation of tile.
  - 1. Comply with additional requirements of TCNA "Handbook for Ceramic, Glass, and Stone Tile Installation," NSI "Dimensional Stone Design Manual," and Division 09 Section "Floor Preparation."
- B. Preparation: Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thin- or medium- set mortar with trowelable leveling and patching compound recommended by tile-setting material manufacturer. Level floors to within 1/8-inch (3 mm) in 10 feet (3 m).

### 3.3 CRACK ISOLATION MEMBRANE INSTALLATION

- A. General: Comply with ANSI A108.17 and manufacturer's written instructions to produce crack isolation membrane of uniform thickness securely bonded to substrate. Install using manufacturer's recommended bedding materials, primers, and adhesives.
  - 1. Install under all areas of tiling including dimension stone and porcelain floor tiling.

### 3.4 TILE INSTALLATION

- A. General: Comply with manufacturer's written instructions, TCNA "Handbook for Ceramic, Glass, and Stone Tile Installation," NSI "Dimensional Stone Design Manual," and ANSI A108 Series and ANSI A137.1. Install tile setting materials over cured crack isolation membrane.
  - 1. Comply with additional requirements of ASTM C1242. Comply with NSI limits for natural stone tiling lippage for dimensional stone tiling.
- B. Cutting: Size, trim, and cut tiling including special shapes to dimensions and patterns indicated or required. Produce cleanly cut, precise edges free of chipping, true to line without marring finish surfaces.
  - 1. Begin and terminate tile fields using whole tile units. Cut no individual tile more than 1/2-inch (12.7 mm). Size, trim, and cut tiles to maintain uniform joint widths.
  - 2. Size and locate tile joints in tiling bases to match field floor joints. Maintain uniform joint widths.
- C. Fabrication: Accurately form intersections and returns. Carefully grind cut edges to produce straight, aligned joints.
  - 1. Fabricate base of dimension stone tile base with smooth top edges.
  - 2. Fabricate porcelain tile base with smooth top edges where factory finished units are not provided.
- D. Setting: Use the proper size trowel and ensure full spread of mortar and complete bedding of tile. Key mortar in substrates thoroughly. Set tiles to ensure proper and full adhesion, free of voids. Set tiles while mortar is stiff enough to resist tile sinking while remaining plastic for full adhesion and workability. Back butter tiles to provide full bedding.
- E. Floor Jointing Pattern: Lay tile in pattern indicated and to align with existing floor jointing where abutting in-place tiling. Lay out tile work and center tile fields in both directions; lay out to minimize tiles that are less than half of a tile. Provide uniform joint widths.
  - 1. Joint Widths: Match existing.
- F. Movement Joints: Locate movement joints and other sealant-filled joints at column centerlines and where otherwise required.
- G. Metal Edge Strips: Install metal edge strips in full setting bed of mortar, flush with top of tiling. Butt strips end to end with hairline joint. Miter corners and butt tight to adjoining materials.

- H. Transitions: Align surfaces of dissimilar finished flooring and floorcoverings to installed tiling. Comply with codes and standards in effect, including accessibility requirements. Avoid abrupt changes in plane.
  - 1. Construct transitions at changes in flooring and at termination to dissimilar flooring materials to produce finished floor surfaces not exceeding slopes greater than 1/8 inch (3 mm) vertical in 3 feet (0.92 m) horizontal and to comply with handicapped accessibility codes and standards in effect.
- I. Tolerances: Install tiling with the following tolerances:
  - 1. Variation in Surface Plane: Not more than 1/8-inch in 10 feet (3 mm in 3 m) from level or slope.
  - 2. Variation in Plane between Adjacent Units (Lipping): Not more than 1/32-inch (0.8 mm).
  - 3. Variation in Joint Width: Not more than 1/32-inch (0.8 mm).

### 3.5 JOINT SEALANTS

- A. General: Construct sealant-filled joints and install joint sealants at all movement joints, including horizontal traffic and non-traffic and vertical non-traffic movement joints. Comply with ASTM C1193.

### 3.6 CLEANING, GROUTING AND SEALING

- A. General: Use only cleaners and methods recommended by manufacturers. Clean tile surfaces after grouting and sealing to remove residue and excess as soon as possible.
- B. Grouting: Clean grout joints prior to applying grout. Apply grout to clean and cured grout joints according to grout manufacturer's instructions. When dry, clean grout haze from tiles.
- C. Sealing: Clean grout joints prior to applying grout sealer. Apply grout sealer to clean and cured grout joints according to grout-sealer manufacturer's instructions.

### 3.7 REPAIRS

- A. General: Replace damaged, permanently stained, un-bonded or partially-bonded tiling, or tiling that otherwise does not comply with requirements.

### 3.8 PROTECTION

- A. General: Protect in-place floor tiling with tempered hardboard placed smooth side down, with joints taped, covered with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. Institute measures to prevent cracking and edge damage.
- B. Traffic: Prohibit foot and wheel traffic from tiled floors until tiling including grouting is cured.
- C. Final Protections: Provide final protection and maintain conditions, in a manner acceptable to Installer, to ensure tiling is without damage and deterioration at the time of Final Acceptance/Substantial Completion.

### 3.9 INTERIOR TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations, Concrete Subfloor: Select from one or more of the following:
  - 1. Basis of Design Floor Tile Installation F125, Tile Over Crack Isolation Membrane: Thin-set or medium bed mortar over concrete floor with primer and bonded crack isolation membrane for existing in-plane cracks; TCNA F125-Partial-14 for above-grade concrete.

- a. Crack Isolation Membrane: Centered on joints or cracks; full sheet width or not less than 3 times the width of tile or stone being installed, whichever is wider.
  - b. Thin-Set Mortar: Latex-portland cement mortar or
  - c. Medium Bed Mortar: Latex-portland cement mortar, as required by condition.
  - d. Grout: Polymer-modified unsanded grout.
  - e. Movement Joints: Sealant-filled; constructed per TCNA EJ-171.
2. Basis of Design Floor Tile Installation F125, Tile Over Crack Isolation Membrane, Full Coverage: Thin-set or medium bed mortar over concrete floor with full coverage crack isolation membrane; TCNA F125-Full-14 for above- grade concrete.
- a. Crack Isolation Membrane: Centered on joints or cracks; full sheet width or not less than 3 times the width of tile or stone being installed, whichever is wider.
  - b. Thin-Set Mortar: Latex-portland cement mortar or
  - c. Medium Bed Mortar: Latex-portland cement mortar, as required by condition.
  - d. Grout: Polymer-modified unsanded grout.
  - e. Movement Joints: Sealant-filled; constructed per TCNA EJ-171.

END OF SECTION 09 31 00

SECTION 09 51 13.42 - ACOUSTICAL PANEL CEILINGS-SEISMIC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  1. Acoustical panels and exposed suspension systems for interior ceilings.
  2. Accessories.
  3. Seismic restraint for suspension systems and ceilings, including lateral force bracing.
  4. Seismic separation joints in suspension systems for acoustical panel ceilings.
  5. Partial removal and reinstallation of existing acoustical ceiling systems to be modified, where indicated or required.
  6. Fitting of acoustical ceiling panels including cutting holes for penetrating items.
  7. Modifications to existing acoustical panel ceilings to suit conditions.

1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect, including:
  1. Division 01 Section "Codes and Standards."
  2. Other Standards: Comply with standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM) and Ceilings and Interior Systems Construction Association (CISCA).

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide acoustical panel ceilings designed and installed to withstand the effects of loads and motions according to codes and standards in effect and the following:
  1. Component Sizes: Not less than that required to comply with ASTM C635/C635M and ASTM C636/C636M and the following:
    - a. Maximum Deflection, Ceiling Suspension Systems:  $L/360$  at hanger spacing of not greater than 48 inches (1219 mm) on center.
    - b. Minimum Load Resistance: Not less than that indicated for main runners and for cross tees.
  2. Seismic Performance: Design, erect, and install to withstand the effects of earthquake motions determined for the Seismic Design Category indicated and according to codes and standards in effect, ASCE/SEI 7, and the following:
    - a. Intersection of main tees and cross tees to withstand not less than 180 lbf. (800 N).
    - b. Connection devices and wires able to withstand not less than 100 lbf. (445 N) or the calculated design load, whichever is greater.
    - c. Splay bracing connections able to withstand not less than 200 lbf. (889 N) or the calculated design load, whichever is greater.
    - d. Main tees able to withstand a minimum simple span uniform load of not less than 1.35 lbf./lf. (1.83 Nm).



- e. Maximum ceiling weight not more than capacity of individual members and components, but in no case less than 4.0 lbs./sq. ft. (19.5 kg/sq. m) per ICC ES ESR-1308.
  - f. Compression struts to withstand not less than 180 lbf. (800 N).
  3. Seismic Restraint: Provide and size ceiling suspension components including supporting and supplemental hangers, rods, connections, bracing, and other means to resist seismic forces and sway displacement to comply with codes and standards in effect.
  4. Panels: Panels weighing more than 0.5 lbs./sq. ft. (2.4 kg/sq. m) shall be positively attached to the ceiling suspension runners.
  5. Acceptance Criteria: ICC ES AC 156.
- B. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: Class A according to ASTM E1264.
  2. Smoke-Developed Index: 50 or less.

## 1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. General: Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Acoustical Ceiling Units: Not less than 2 full boxes.

## 1.6 WARRANTY

- A. Acoustical Ceiling Manufacturer's Special Warranty: Written warranty signed by ceiling system manufacturer agreeing to promptly replace panels or suspension components which have visibly sagged or otherwise failed to perform as defined by manufacturer, resulting from defects in materials or workmanship for the following warranty period:
1. Suspension System Warranty Period: Not less than 10 years from date of Preliminary Acceptance/Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Source Limitations: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

### 2.2 ACOUSTICAL PANELS

- A. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.
- B. Characteristics, 24-by-24 inch- (610 mm-by-610 mm-) Ceiling:
1. Modular Size: 24 by 24 inches (610 by 610 mm).
  2. Classification: Provide panels as follows:
    - a. Type and Form: Type III, mineral base with painted finish; Form 2, water felted.
    - b. Pattern: Match existing.
    - c. Fire: Class A.
  3. Color: White (WH).
  4. Light Reflectance (LR): ASTM C1477; not less than existing.

5. Ceiling Attenuation Class (CAC): ASTM C1414; not less than 35.
  6. Noise Reduction Coefficient (NRC): ASTM C423; UL classified; not less than 55.
  7. Edge/Joint Detail: Square.
  8. Thickness: 5/8-inch (16 mm) minimum.
  9. Acoustical Panel Weight: Not less than 0.70 lbf/sq. ft. (3.2 N/sq. m), unless otherwise indicated.
  10. Dimensional Stability: Manufacturer's standard sag- and humidity- resistant formulation, panel capable of maintaining dimensional stability and resisting visible sag under conditions of elevated humidity at ambient temperature not exceeding 120 deg. F (49 deg. C) at maximum humidity exposure of 100 percent, excluding standing water.
    - a. Basis of Design: HumiGuard Plus; Armstrong World Industries, Inc.
  11. Product: Subject to compliance with requirements, provide the following:
    - a. Basis of Design: Match existing pattern; Armstrong World Industries, Inc.
    - b. No substitutions permitted.
- C. Characteristics, 24-by-48 inch- (610-by -1219 mm-) Ceiling:
1. Modular Size: 24 by 48 inches (610 by 1219 mm).
  2. Classification: Provide panels as follows:
    - a. Type and Form: Type III, mineral base with painted finish; Form 2, water felted.
    - b. Pattern: C E.
    - c. Fire: Class A.
  3. Color: White (WH).
  4. Light Reflectance (LR): ASTM C1477; not less than 0.82.
  5. Ceiling Attenuation Class (CAC): ASTM C1414; 35 or better.
  6. Noise Reduction Coefficient (NRC): ASTM C423; UL classified; 0.55 or better.
  7. Edge/Joint Detail: Square.
  8. Thickness: 5/8-inch (16 mm) minimum.
  9. Acoustical Panel Weight: Not less than 0.70 lbf/sq. ft. (3.2 N/sq. m), unless otherwise indicated.
  10. Dimensional Stability: Manufacturer's standard sag- and humidity- resistant formulation, panel capable of maintaining dimensional stability and resisting visible sag under conditions of elevated humidity at ambient temperature not exceeding 120 deg. F (49 deg. C) at maximum humidity exposure of 100 percent, excluding standing water.
    - a. Basis of Design: HumiGuard Plus; Armstrong World Industries, Inc.
  11. Product: Subject to compliance with requirements, provide the following:
    - a. Basis of Design: Fine Fissured 1729; Armstrong World Industries, Inc.
    - b. No substitutions permitted.

### 2.3 METAL SUSPENSION SYSTEM

- A. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C635/C635M and designated by type, structural classification, and finish indicated.
- B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 (Z90) coating designation; with prefinished 15/16-inch- (24-mm-) wide metal caps on flanges.
  1. Structural Classification: Heavy-duty system.
  2. End Condition of Cross Runners: Override (stepped) type.
  3. Face Design: Flat, flush.
  4. Cap Material: Cold-rolled steel or aluminum.
  5. Cap Finish: Painted to match color of acoustical unit.
  6. Products: Subject to compliance with requirements, provide the following:
    - a. Basis of Design: Prelude XL; Seismic RX Suspension System; Worthington Armstrong Venture Suspended Ceiling Systems; Worthington Armstrong Venture (WAVE).
      - 1) Comply with ICC ES ESR-1308.
      - 2) No substitutions permitted.

- b. Main Beams: 7301 HD Main Beam with Superlock staked on end clip; capable of sustaining not less than 16.73 lbf per linear foot.
- c. Cross Tees:
  - 1) XL7341 48 inch- (1219 mm-) Cross Tee; capable of sustaining not less than 16.59 lbf per linear foot.
  - 2) XL7328 24 inch- (610 mm-) Cross Tee; capable of sustaining not less than 40.45 lbf per linear foot.
- d. Beam End Retaining Clip: BERC2.
- e. Seismic Joint Clip, Main Beam: SJMR15.
- f. Seismic Joint Clip, Cross Tees: As suited to top bulb of suspension grid.
  - 1) SJCG; for use with peak-formed bulbs.
  - 2) SJCSI; for use with square bulbs.
- g. Expansion Sleeve: ES4; finished to match exposed caps of main beams and cross tees.
- h. Expansion Sleeve: ES4; finished to match exposed caps of main beams and cross tees.
  - 1) Use within area of systems and where new systems intersect exiting suspension system.
- i. Single Tee Adapter Clip: For use where cross tee intersects with main beam and is not locked into place with another cross tee; pullout strength not less than 180 lbf. (800 N); STAC Clip.
- j. Adjustable Grid Spacer Clips: Sized for spacing two parallel main beams for lighting fixtures or air diffusers; adjustable.
  - 1) GSC9; for 1 inch- to 4 inch- (25 mm- to 102 mm-) main beam spacing.
  - 2) GSC12; for 4 inch -to 8 inch- (102 mm- to 203 mm-) main beam spacing.
  - 3) GSC16; for 8 inch- to 16 inch- (203 mm- to 406 mm-) main beam spacing.
- k. Outside Corner Cover: 7863; with 2-inch (51 mm) legs; sized for trim molding; snap fitting; used where outside corner is not field mitered.
- l. Bracing Attachment Clip: BAGG90A or manufacturer's BAC; size and thickness required to resist loads and develop connection from steel-framed compression strut to flanges of main tees; length not less than 2-1/2 inches (63.5 mm).
- m. Other Connectors, Clips, and Accessories: As required by condition and per manufacturer.

## 2.4 ACCESSORIES

- A. Attachment Devices and Fasteners: Size for 5 times the design load indicated in ASTM C635/C635M, Table 1, "Direct Hung," unless otherwise indicated.
  - 1. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E1190, conducted by a qualified testing and inspecting agency.
  - 2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Basis of Design Fasteners: X-U Series; X-U 15 Series; X-P Series; Hilti Inc.
      - 1) Comply with ICC ESR-2269.
    - b. Fasteners: ITW Ramset.
      - 1) Comply with ICC ES ESR-1799.
    - c. Basis of Design Threaded Stud Fasteners: X-W6 Series; W10 Series; Hilti Corporation.
      - 1) Comply with ICC ES ESR-1663.
- B. Hanger Attachments to Concrete Decks:
  - 1. Powder-Actuated Ceiling Clip Assemblies: Suitable for application indicated; corrosion-resistant per ASTM B633; of type, size, holding power, and other properties required for structural performance, to withstand loads imposed without exceeding allowable design stresses.
    - a. Ceiling Clips: Not less than 0.0897-inch (13 gauge) (2.28 mm) steel clips or other devices for attaching hangers of type indicated.

- b. Wire Hangers: ASTM A641/A641M, Class 1 zinc coated wire hangers, soft temper; not less than 0.1055-inch- (2.7-mm-) (12 gauge) diameter steel wire.
      - c. Capacity: Capable of sustaining, without failure a load equal to at least 5 times that imposed by construction as tested according to ASTM E1190.
    2. Powder-Actuated Rod Hanger Assemblies: Suitable for application indicated; corrosion-resistant; of type, size, holding power, and other properties required for structural performance, to withstand loads imposed without exceeding allowable design stresses; with clips for attaching threaded steel rods of type indicated, and capable of sustaining, without failure, a load equal to at least 5 times that imposed by construction as determined by testing.
      - a. Rod Hanger: Not less than 3/8-inch (9.5 mm) threaded rod.
    3. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not necessarily limited to, the following:
      - a. Basis of Design Ceiling Clip Assemblies: X-CC27 U27 Series; Hilti Corporation.
        - 1) Use not less than X-CC27 C27, X-CC27 U27, or X-CC27 XALH27.
        - 2) Comply with ICC ES ESR-2184.
      - b. Basis of Design Ceiling Wire Assemblies: X-CW Series; Hilti Corporation.
        - 1) Comply with ICC ES ESR-2892.
      - c. Basis of Design Rod Hanger: X-HS Series; X-HS MX Series; Hilti Corporation.
        - 1) Comply with ICC ES ESR-2795.
- C. Wire Hangers, Braces, and Ties: Capable of supporting not less than 100 lbs. (445 N) or the actual loads imposed, whichever is greater, and complying with the following:
  1. Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.
  2. Stainless-Steel Wire: ASTM A580/A580M, Type 304, nonmagnetic.
  3. Nickel-Copper-Alloy Wire: ASTM B164, nickel-copper-alloy UNS No. N04400.
  4. Size: Wire diameter sufficient for its stress at 3 times hanger design load (ASTM C635/C635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch- (2.69-mm-) (12 gauge) diameter wire.
- D. Hanger Rods and Flat Hangers: As required; mild steel, zinc coated or protected with rust-inhibitive paint.
- E. Angle Hangers: Angles with legs not less than 7/8 inch (22 mm) wide; formed with 0.04-inch- (1-mm-) thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation; with bolted connections and 5/16-inch- (8-mm-) diameter bolts.
- F. Non-Structural Metal-Framed Compression Struts: Interior, non-structural, metal-framing members including studs and connectors and accessories to comply with Division 09 Section "Non-Structural Metal Framing - Seismic."
  1. Size: As indicated in Drawings; capable of withstanding not less than 180 lbf. (445 N) or design load, whichever is greater.
- G. Seismic Clips: Manufacturer's standard seismic clips to comply with codes and standards in effect including CABC Chapter 16, for panels weighing more than 1/2 lbs./sq. ft. (24 N/sq. m) to be positively attached to ceiling suspension runners.
- H. Post-Installed Expansion Anchors: Corrosion-resistant; with capability to sustain, without failure, a load not less than 5 times design load, as determined by testing.
  1. Material: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/ASTM F1941M, Class Fe/Zn 5, unless otherwise indicated.
  2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not necessarily limited to the following:
    - a. Basis of Design: Kwik Bolt 3 (KB3); Hilti Inc.
      - 1) Comply with ICC ESR-2302.
    - b. Basis of Design Kwik Bolt TZ (KB-TZ); Hilti Inc.
      - 1) Comply with ICC ES ESR-1917.

- c. Basis of Design Kwik Bolt VTZ (KB-VTZ); Hilti Inc.
  - 1) Comply with ICC ES ESR-3904.

## 2.5 METAL EDGE MOLDINGS AND TRIM

- A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.
  - 1. Edge moldings shall fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless otherwise indicated.
  - 2. Perimeter Edge Molding: Not less than 2-inches (51 mm) horizontal leg where ceilings exceed 25 feet (7620 mm) between perimeter walls in both directions; not less than 7/8-inch (22.2 mm) elsewhere.
  - 3. Products: Subject to compliance with requirements, provide the following:
    - a. Basis of Design, 2-inch (51 mm) Molding: 7808; Seismic RX; Worthington Armstrong Venture Suspended Ceiling Systems; Worthington Armstrong Venture (WAVE).
      - 1) Comply with ICC ES ESR-1308.
    - b. Basis of Design, 7/8-inch (22.2 mm) Molding: HD7801; Seismic RX; Worthington Armstrong Venture Suspended Ceiling Systems; Worthington Armstrong Venture (WAVE).
      - 1) Comply with ICC ES ESR-1308.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine substrates, areas, and conditions with Installer present, for compliance with requirements that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
  - 1. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 PREPARATION

- A. Removal of Existing Panel Ceilings for Modification or Replacement: Carefully remove lighting and other fixture trims, escutcheons, fire suppression heads and escutcheons, ceiling-mounted equipment and devices, and other items within existing acoustical panel ceilings. Avoid damage to items during removal, handling, and reinstallation. Where items to be removed for ceiling panel removal and replacement require specialized skill, work closely with other Contractors for temporary disconnection, removal, and reinstallation of items.
  - 1. Work closely with Contractor responsible for temporarily disconnecting electrical items and lighting where temporary removal from service is required to allow panel removal and replacement.
  - 2. Work closely with Owner for temporary removal and reinstallation of Owner's ceiling mounted equipment.
  - 3. Remove existing acoustical ceiling panels after initial preparations are complete. Take care in removing existing panels for items that may be above ceilings or debris and dirt on top of panels.

- a. Do not remove panels if hazardous materials including suspected or presumed asbestos-containing materials (ACM) are present on top of panels.
- B. Layout: Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling unless otherwise indicated. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown in Drawings.
- C. Penetrations: Layout openings for penetrations centered on the penetrating items.

### 3.3 INSTALLATION

- A. Installation: Install acoustical panel ceilings according to ASTM C636/C636M, manufacturer's written instructions, and:
  - 1. ASTM E580/ E580M, including Section 5 for ceilings in Seismic Design Categories.
  - 2. CISCA "Ceilings Use and Practice."
  - 3. CISCA "Ceiling Systems Handbook."
- B. Suspension Systems: Suspend ceiling hangers from building's structural members and as follows:
  - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
  - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  - 3. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of 4 tight turns within a 3-inch (75-mm) length to comply with ASTM C636/C636M.
- C. Hangers and Bracing Wires: Connect hangers and bracing wires directly to structure or other devices that are secure and appropriate for loads and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
  - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum.
    - a. Install vertical hanger wires to withstand not less than 100 lbf (445 N) or the calculated design load, whichever is greater.
    - b. Install hanger wires spaced not greater than 48 inches (1219 mm) on center or in a tributary area of 16 square feet (1.48 sq. m) or less unless otherwise indicated.
    - c. Install hanger wires not more than 8 inches (200 mm) from perimeter wall conditions unless otherwise indicated.
  - 2. Splay vertical hangers only where required to miss obstructions; offset resulting horizontal forces by seismic bracing, countersplaying, or other equally effective means.
    - a. Do not exceed 1 in 6 maximum plumb of vertical for hanger wires.
  - 3. Install supplemental channels, trapeze hangers, or other framing members between structural members to support hangers.
  - 4. Secure, anchor, and attach flat, angle, channel, and rod hangers to structure or intermediate framing members.
  - 5. Fasten hangers using anchors or power-actuated fasteners that extend through forms into concrete.
  - 6. When conditions do not permit installation of hanger wires at spacing required, install steel channels, slotted channels, carrying channels or other supplemental support for attachment of hanger wires capable of sustaining design loads.
- D. Power-Actuated Fasteners: Install to meet or exceed design or service loads, whichever is greater, with minimum embedment required to develop full strength of fasteners.
  - 1. For ceiling clips for suspension wires or seismic splay bracing wires installed with power-actuated fasteners, install to meet or exceed design or service loads, whichever is greater, with minimum embedment required to develop full strength and pullout or lateral resistance of fasteners.
  - 2. Do not use for tension load applications unless approved for such loading.

- E. Lateral Restraint, General: Install suspension system with lateral seismic restraint to comply with codes and standards in effect, ASTM C636/C636M, ASTM E580/E580M, and authorities having jurisdiction.
  - 1. Install bracing, bracing wires, non-structural metal framing struts or a combination of these to resist and restrain anticipated seismic forces to structure for ceiling suspension systems.
    - a. Electrical conduit is not permitted as a component of seismic restraint.
  - 2. Install positive bracing to structure at changes in ceiling plane elevations or discontinuity of the suspension system.
  - 3. Install lateral force bracing at not more than 12 feet (3657 mm) on center in both directions, starting not more than 4 feet (1219 mm) from walls.
  - 4. Install lateral force bracing systems to limit ceiling movement to less than 1/4-inch (6 mm) at point of connection.
  - 5. Install horizontal restraint wire or rigid bracing unless otherwise required by codes in effect.
  - 6. Provide positive bracing capable of accepting anticipated loads at changes in ceiling plane or at discontinuity of suspension systems.
  
- F. Lateral Restraint Splay Bracing Wires: Provide splay bracing wires as part of overall lateral restraint unless rigid bracing is used. Connect bracing wires from building's structural members. Fasten bracing wires into concrete with post-installed anchors or power-actuated fasteners.
  - 1. Install seismic splay bracing connections to withstand not less than 200 lbf (889 N) or the calculated design load, whichever is greater.
  - 2. Install four hanger wires at each lateral restraint location splayed in four directions 90 degrees apart and connected to main runners within 2 inches of a cross runner and to structure above at an angle not exceeding
  - 3. Install splay wires of not less than diameter of wire indicated.
  - 4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of 3 full, tight turns (360 degrees each) within a 3-inch (75-mm) length to comply with ASTM C636/C636M and ASTM E580/E 80M.
  
- G. Compression Struts: Install non-structural metal framing strut to resist loads of not less than 180 lbf. (800 N) and to restrain ceiling vertical movement to 1/4-inch (6 mm) or less at the point of connection.
  - 1. Fasten metal framed compression strut to main beams by one of the following:
    - a. Attach and anchor framing compression strut web directly below top bulb of ceiling suspension main beam with not less than 2 sharp point #10 screw fasteners unless otherwise indicated.
    - b. Attach and anchor metal attachment clip to metal framed compression strut through web of framing with not less than 2 sharp point #10 screw fasteners. Attach and anchor clip to side of main beam flange below top bulb with not less than 2 sharp point #10 screw fasteners unless otherwise indicated.
  - 2. Drive screw fasteners to extend through sheet steel and main beam connection a minimum of 3 exposed threads, to penetrate individual components of without causing permanent separation between components.
  
- H. Edge Moldings and Trim: Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
  - 1. Miter corners accurately and connect securely.
  - 2. Screw fasten trim and moldings to substrate at not more than 24 inches (600 mm) on center nor more than 3 inches (75 mm) from ends.
  - 3. Leveling molding and trim with ceiling suspension system to a tolerance of 1/8-inch in 12 feet (3.2 mm in 3.65 m).
  - 4. Do not use exposed fasteners, including pop rivets, on moldings and trim.
  
- I. Moldings: Install edge moldings and trim of type indicated. Do not use exposed fasteners, including pop rivets.
  - 1. Screw attach moldings and trim at not more than 16 inches (400 mm) on center and not more than 3 inches (75 mm) from ends. Miter corners accurately and connect securely.

- J. Runners and Cross Tees: Install suspension-system runners and cross tees so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
1. Install main beam and cross tee intersections and connections to resist loads of not less than 180 lbf. (800 N) in compression and tension.
  2. Install connection devices and wires able to resist loads of not less than 100 lbf (445 N) or the calculated design load, whichever is greater.
  3. Attach suspension system tees to perimeter edge moldings and trim at two opposite walls to comply with ASTM E580/E580M. At other walls, do not attach suspension system tees to perimeter edge moldings and trim; maintain clearances of not less than 3/4-inch (19 mm) from end of tees to wall.
  4. Install manufacturer's clips or otherwise tie ends of main beams and cross tees together to prevent spreading.
- K. Seismic Separation Joints: Install manufacturer's seismic joint clips on main beam and cross tees where separation joints occur, with expansion sleeves snap fit over ends of beams or tees to comply with ASTM E580/E580M. Produce separation joint between suspension grid members with clearance of not less than 3/4-inch (19 mm). Center expansion sleeve over center of separation joints.
1. At ceiling areas exceeding 2500 sq. ft. (232.3 sq. m), provide seismic separation joints to break up ceiling area into areas not exceeding 2500 sq. ft. (232.3 sq. m), each with a ratio of the long to the short dimension less than or equal to 4, unless engineering demonstrates ceiling penetrations and closure angles provide sufficient clearance to accommodate lateral displacement.
  2. Install additional hanger wires within 3-inches (76 mm) of seismic separation joints.
- L. Fire Suppression Sprinklers: Cut and fit penetrations in acoustical ceiling panels for fire protection sprinkler heads and canopies to comply with ASTM C 636/C 636M and ASTM E 580/E 580M and CBC Section 714 or another relevant article.
1. Center sprinkler head penetrations between panel scores within panel.
  1. All sprinkler heads (drops) except floor-ceiling or roof-ceiling fire-resistive assemblies, shall have a 2 inch (50 mm) oversize ring, sleeve, or adaptor through the ceiling tile to allow for free movement of at least 1 inch (25 mm) in all horizontal directions unless a swing joint that can accommodate 1 in. (25 mm) of ceiling movement in all horizontal directions is provided at the top of the sprinkler head extension.
- M. Diffusers, Registers, Grilles, and Terminal Air Devices: Install suspension-system cross tees and supplemental tees coordinated with diffusers, registers, grilles, and terminal air devices. Install with clips, fittings, clamps, or other connectors to attach to main runners and tees.
1. For terminal air devices of sizes to fit module of suspension system, install secondary tees to create openings for terminal air devices including diffusers, registers, and grilles.
  2. For terminal air devices smaller than the modular size of suspension system, install suspension system without exposed cross or supplemental tees.
  3. Air diffusers weighing not more than 20 pounds and which receive no tributary loading from ductwork may be positively attached by screws or fasteners to and supported by ceiling runners.
  4. Cut panels precisely to fit flanges, trims, and other finish edges of fixtures and fully cover holes or openings in panels.
  5. Avoid seaming panels around terminal air devices or cutouts.
- N. Lighting Fixtures: Install suspension-system coordinated with lighting fixture support, fixture flange, and finish trim requirements. Support lighting fixtures directly by wires except for:
1. Recessed lighting fixtures weighing not over 56 lbs. (25.4 kg) and suspended and independently hung fixtures not over 20 lbs. (9.0 kg) in weight may be supported and attached directly to the ceiling system runners by a positive attachment such as screws or bolts
    - a. Do not attach fixtures to ceiling grid in any manner that will affect independent support in the event of displacement or loss of ceiling.
    - b. Do not support fixtures from main beam (runners) and cross tees (runners) if the weight of the fixtures exceeds the total dead load to exceed the capability of the suspension system.



2. Attach surface mounted fixtures to main beams with at least 2 positive clamping devices made of materials not less than 14 gage thick. Do not use rotational spring catches. Provide independent support attached to each clamping device and to the structure above.
  3. Cut holes or openings in panels precisely to fit flanges, trims, and other finish edges of fixtures and fully cover holes or openings in panels. Do not seam panels around fixtures or cutouts.
  4. For lighting fixtures sized to fit module of suspension system, install secondary tees.
  5. Install linear lighting fixtures to maintain overall suspension system modular layout and dimensions, taking into consideration lighting fixture flange thicknesses.
  6. Do not overlap flanges of fixtures onto suspension system members.
- O. Ceiling-Mounted Systems and Devices: Produce and fit penetrations in acoustical ceiling panels for ceiling-mounted fire alarm devices, speakers, data and communications equipment and devices, and other systems, equipment, devices to comply with ASTM C636/C636M and ASTM E580/E580M.
- P. Exit Lights: Install suspension-system coordinated with support and finish trim requirements. Support exit lights directly from structure.
- Q. Modifications to Existing Acoustical Panel Ceiling Systems: Where ceilings are disturbed or otherwise indicated to be modified, remove and reuse, or remove and replace existing suspension system components, panels, and accessories where disturbed. Align new ceiling suspension systems to existing suspension systems where indicated or required; remove existing damaged or twisted suspension system members and replace with new system members.
1. Where required, remove main suspension beams to suitable point of connection with new system and extend main runners. Provide positive connections via clips or other devices.
  2. Where required, remove cross tees or secondary tees and salvage, or where unsalvageable, replace with new members.
  3. Install hangers and seismic provisions for all ceilings modified or disturbed. Provide new seismic hangers, supports, compression struts, bracing or other components or systems to supplement or replace existing systems.
  4. Avoid placing new loads on existing suspension members not designed to receive those loads.
  5. Install expansion sleeves between new and existing suspension systems, leaving sufficient clearance for anticipated lateral movement during seismic events.
  6. Where occurring, install ceiling panels and attachments to protect lighting fixtures and terminal air ducts and devices according to requirements indicated for any existing acoustical panel ceiling fire-resistance-rated assemblies.
  7. Install new hangers to structure with 6 inches (150 mm) of the end of discontinuous main runners unless positive bracing is installed.
- R. Panels: Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.
1. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
  2. Cut holes in panels precisely.
  3. Reinstall existing panels and install new panels in accordance with requirements indicated.
  4. Install seismic clips at existing panels disturbed where required by codes and standards in effect. Install in accordance with requirements for new ceilings.
- S. Powder-Actuated Fasteners: Test powder-actuated fasteners to comply with codes and standards in effect, but not less than 5 percent of total fasteners installed, but in no case less than 5 fasteners.

### 3.4 ERECTION TOLERANCES

- A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8-inch in 12 feet (3 mm in 3.6 m) non-cumulative.
1. Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8-inch in 12 feet (3 mm in 3.6 m), non-cumulative.

3.5 OWNER'S FIELD QUALITY CONTROL

- A. Special Inspections: Owner may engage a qualified special inspector to perform tests and inspections and prepare test reports, to perform special inspections for overall compliance of seismic design.
- B. Defective: Acoustical panel ceilings will be considered defective if they do not pass tests and inspections.

3.6 REPAIRS

- A. General: Comply with manufacturer's written instructions for minor touchup. Remove and replace ceiling components that cannot be successfully cleaned and repaired. Replace damaged and broken panels.

3.7 CLEANING

- A. Cleaning: Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturers written instructions for cleaning.

3.8 PROTECTION

- A. Final Protections: Provide final protection and maintain conditions in a manner acceptable to Installer that ensure acoustical panel ceilings are without damage and deterioration at the time of Substantial Completion/Final Acceptance.

END OF SECTION 09 51 13.42

SECTION 09 60 23 - FLOORING AND FLOOR COVERINGS TEMPORARY PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Temporary protection for interior flooring and floor coverings.

PART 2 - PRODUCTS

2.1 TEMPORARY MATERIALS

- A. General: Provide temporary flooring protection materials that are compatible with one another and flooring under conditions of service and application. Select from one or more of the following, or a combination of these.
- B. Red Rosin Paper: Heavy weight, recycled fibers, non-adhesive; tear and water resistant.
  - 1. Minimum Thickness: Not less than 15 lb. nominal; 0.11 mil (0.27 mm).
  - 2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not necessarily limited to, the following:
    - a. Danco Converting.
    - b. Grip-Rite; PrimeSource Building Products, Inc.
    - c. Trimaco, Inc.
    - d. W. R. Meadows, Inc.
- C. Tempered Hardboard: ANSI A135.4; wet-dry or dry process manufactured of hardwood fibers; S2S; Class 1 commercial, oil-tempered both sides; smooth one side, textured on opposite side; new, slip-resistant, stain resistant, non-marring.
  - 1. Minimum Thickness: 1/4-inch (6 mm).
  - 2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not necessarily limited to, the following:
    - a. Hardboard; Georgia Pacific Wood Products, LLC.
    - b. Hardboard; Stimson Lumber Co.
    - c. Hardboard; Panel Processing, Inc.; Panel Processing of Virginia, Inc.; Holland Panel Products, Inc., subsidiary of Panel Processing, Inc.
- D. Laminated Glass-Fiber Kraft Paper: New, slip-, stain- and water- resistant, non-marring, leaving no residue; puncture, tear, and abrasion resistant; removable; laminated glass-fiber reinforced kraft paper.
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not necessarily limited to, the following:

- a. Fortifiber Seekure; Fortifiber Building Systems Group.
  - b. Kraft Shield; Surface Shields Incorporated.
  - c. UltraKraft; Protective Products, Inc.
- E. Protection Boards or Mats: New, slip-resistant, stain resistant, non-marring boards or mats; leaving no residue; removable; not less than 3-mil thickness.
- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not necessarily limited to, the following:
    - a. Ram Board RB 38-100; Project Mat RBPM 36-6; Ram Board.
    - b. Builder Board with Liquid Shield; Cover Shield CVR2036100 Premium; Surface Shields Incorporated.
    - c. Grip-Rite Construction Board; PrimeSource Building Products, Inc.
    - d. Flexboard; Protective Products International, Inc.
- F. Fabric-Backed Flooring Protection: New, slip-resistant, stain resistant, non-marring fabric-backed mats or rolls; removable; not less than 3-mil thickness.
- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not necessarily limited to, the following:
    - a. Titan Floor Protection; Grip-Rite; PrimeSource Building Products, Inc.
    - b. Dura Runner Plus Fabric; Protective Products International, Inc.
- G. Plywood: DOC PS 1; size and thickness as required for application; not less than 3/4-inch (19 mm) nominal, 21/32-inch (18.3 mm) actual thickness for heavy duty loads.
- H. Dimension Lumber Items: Construction or No. 2 grade lumber or better of any species.
- I. Concrete Screw Anchor: Self-tapping, for pre-drilled holes; corrosion resistant cured polymer-type coating; countersunk head; length for embedment into concrete not less than that required for application.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of flooring and floorcoverings.
- B. Proceeding: Proceed with preparations only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 PREPARATION

- A. Layout: Clean flooring or floorcoverings prior to application of coverings or protection.

### 3.3 INSTALLATION OF TEMPORARY COVERINGS AND PROTECTIONS

- A. General: Select temporary coverings for conditions of service and underlying materials. Install coverings according to manufacturer's written requirements.

- B. Installation: Cover otherwise exposed conditions or openings until permanent construction is completed. Install temporary barriers and coverings according to manufacturer's instructions and the following:
  - 1. Install within temperature and humidity limitations of manufacturer.
  - 2. At corners, turn continuously around corner; do not cut at corner. Lap ends and seal to form continuous protective surface.
  - 3. Where required, roll or firmly press underlayment firmly to ensure and promote full adhesion.
  - 4. Attach or otherwise secure against displacement and to prevent tripping.
  - 5. Tape and fully adhere seams to and cover vulnerable substrates and prevent tripping or tearing.
  
- C. Stone/Marble/Ceramic/Porcelain Floor Tile Protection: Cover finished floor tiles with non-staining corrugated cardboard or non-adhering, loose protection products with not less than 1/4-inch (6 mm) thick tempered hardboard or engineered board flooring protection cover. Use rosin paper where required to isolate tiling from protection boards. Seal seams with self-adhering tape.
  - 1. For heavy loads or traffic, install loose-laid plywood protection on top of protection products.
  
- D. Carpeting Protection: Cover finished carpeting with removable, slip-resistant, non-adhering protection products. Select product of widest width to minimize seams. Do not use self-adhering carpet films. Maintain protections daily. Remove prior to manufacturer's time limit for installation.
  
- E. Transitions to Flooring in Progress: Where transitions at flooring in progress occur, or where unfinished flooring materials and edges are exposed to traffic, provide dimension lumber or strips. Bevel leading, exposed lumber edges.
  - 1. Provide wood transition strips not less than 2-1/2 inches (63.5 mm) in width.
  - 2. Drill concrete and attach using concrete screw anchor or other fasteners or anchors.

END OF SECTION 09 60 23

## SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Resilient base.
  - 2. Accessories
  - 3. Auxiliary materials.

#### 1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect, including:
  - 1. Division 01 Section "Codes and Standards."
  - 2. Other Standards: Comply with additional codes and standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM) and National Fire Protection Association (NFPA).

### PART 2 - PRODUCTS

#### 2.1 RESILIENT BASE

- A. Product Standard: ASTM F1861, Type TS (rubber, vulcanized thermoset), Type TP (rubber, thermoplastic), or Type TV (vinyl, thermoplastic), or a combination of these, Group I (solid, homogeneous), and as indicated by manufacturer's designations in Drawings.
  - 1. Fire-Test-Response Characteristics: ASTM E648 or NFPA 253.
  - 2. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
  - 3. Style and Location:
    - a. Style A, Straight: Provide in areas with carpet floor coverings.
    - b. Style B, Cove: Provide in areas with resilient floor coverings and where indicated.
- B. Thickness: 0.125 inch (3.2 mm).
- C. Height: As indicated by manufacturer's designations in Drawings, or if not otherwise indicated, 4 inches (102 mm).
- D. Lengths: Cut lengths 48 inches (1219 mm) long or coils in manufacturer's standard length.
- E. Finish: As indicated by manufacturer's designations in Drawings.
- F. Colors: As indicated by manufacturer's designations in Drawings.

- G. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - 1. As indicated by manufacturer's designations in Drawings.

## 2.2 ACCESSORIES

- A. Description: Rubber or vinyl moldings for:
  - 1. Carpet edge molding for glue-down applications
  - 2. Transition strips.
- B. Profile and Dimensions: As indicated in Drawings or as otherwise required by condition; dimensions as required to comply with codes and standards in effect, including accessibility standards.
- C. Colors: As indicated by manufacturer's designations in Drawings.
- D. Manufacturer: By same manufacturer as resilient base.

## 2.3 AUXILIARY MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
  - 1. Comply with Division 09 Section "Floor Preparation."
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated; compatible with substrates under conditions of service and application.
  - 1. For application to concrete slabs, capable of being applied where water vapor emissions measure up to 90 percent relative humidity (RH).

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 PREPARATION

- A. General: Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
  - 1. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- B. Acclimation: Do not install resilient products until materials are the same temperature as space where they are to be installed.

1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

### 3.3 RESILIENT BASE INSTALLATION

- A. General: Comply with manufacturer's written instructions for installing resilient base. Stretching: Do not stretch resilient base during installation.
- B. Lengths: Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- C. Adhesion: Tightly adhere base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- D. Corners: Field form using straight pieces of maximum lengths possible and form with returns not less than 3 inches (76 mm) in length.
  1. Outside Corners: Form without producing discoloration (whitening) at bends.
  2. Inside Corners: Miter or cope corners, or both, to minimize open joints.

### 3.4 RESILIENT ACCESSORIES INSTALLATION

- A. Resilient Accessories: Do not stretch resilient base during installation. Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of flooring or floor coverings that would otherwise be exposed.
  1. Install accessories to comply with codes and standards in effect, including accessibility requirements.

### 3.5 REPAIRS

- A. General: Remove and replace resilient base and accessories that are damaged, defective, or otherwise do not comply with requirements. Install replacements to match surrounding materials.

### 3.6 CLEANING

- A. General: Comply with manufacturer's written instructions for cleaning resilient products. Remove adhesive and other blemishes from surfaces.

### 3.7 PROTECTION

- A. General: Protect resilient products from mars, marks, indentations, and other damage.
- B. Final Protections: Provide final protection and maintain conditions, in a manner acceptable to Installer, to ensure resilient base and accessories are without damage or deterioration at time of Preliminary Acceptance/Substantial Completion.

END OF SECTION 09 65 13



## SECTION 09 65 19.23 - MODULAR RESILIENT FLOORING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  1. Owner-furnished modular resilient luxury vinyl plank (LVT) flooring.
  2. Adhesives.
  3. Trowelable leveling and patching compounds.
  4. Resilient and other installation accessories.
  5. Preparation of surfaces and substrates to receive resilient flooring.

#### 1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect and authorities having jurisdiction including the following; where requirements conflict, comply with the most stringent provisions.
  1. Division 01 Section "Codes and Standards."
  2. Other Standards: Comply with additional codes and standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM) and National Fire Protection Association (NFPA).

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Storage: In addition to requirements of Division 01 Sections, store resilient products and installation materials in dry spaces, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 85 deg F (29.4 deg C).
  1. Store flooring flat and squarely on top of each other, away from vents or direct sunlight. For palletized storage, comply with manufacturer's recommendations for plywood interlayers and quarter turning of boxes. Do not stack above manufacturer's maximum heights.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of resilient flooring to include in maintenance manuals.

#### 1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. General: Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  1. Resilient Flooring: Balance of box quantity used for project.

## 1.7 PROJECT CONDITIONS

- A. General: Maintain ambient temperatures within range recommended by manufacturer in spaces to receive resilient flooring during the following periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- B. Concrete Substrates: Do not install modular resilient flooring over concrete slabs until slabs are sufficiently dry to bond with adhesive, with moisture, alkalinity and pH recommended by resilient flooring manufacturer.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient flooring, as determined by testing identical products according to ASTM E648 or NFPA 253 by a qualified testing agency.
  - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

### 2.2 RESILIENT FLOORING

- A. Modular Resilient Plank Flooring: Products meeting or exceeding the following characteristics:
  - 1. Resilient Flooring Standard: ASTM F1700.
  - 2. Construction: Commercial High Performance Luxury Vinyl Tile.
  - 3. Class: ASTM F1700; Class III, printed vinyl tile.
  - 4. Total Thickness: Not less than 0.177-inch (4.5 mm), unless otherwise indicated in Drawings.
  - 5. Backing Class: Commercial Grade.
  - 6. Nominal Dimensions: As indicated by manufacturer's designations in Drawings.
  - 7. Slip Resistance: ASTM D2047; Static Coefficient of Friction (SCOF) 0.55 wet or better; SCOF 0.55 dry or better.
  - 8. Static Load Limit: ASTM F970; passes; not less than 1500 lbs./sq. in. (psi) (105.46 kg/sq. cm).
  - 9. Radiant Panel: ASTM E648; passes; minimum Class I.
  - 10. Smoke Density: ASTM E662; passes; less than or equal to 450.
  - 11. Installation: Adhered.
  - 12. Resource: As indicated in Drawings.
  - 13. Sizes, Colors, and Patterns: As indicated in Drawings and Color and Material books.

### 2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient flooring manufacturer for applications indicated.
  - 1. Provide materials meeting maximum moisture and pH requirements.
  - 2. In addition, comply with requirements of Division 09 Section "Floor Preparation."
- B. Concrete Primers: Manufacturer's recommended non-staining formulation.
- C. Adhesives: Water-resistant, mildew-resistant, nonstaining type that is recommended or provided by resilient flooring and adhesive manufacturers; capable of permanent bonding at up to 90 percent relative

humidity level and pH of 8.0 to 10.0; compatible with substrates under conditions of service and application.

1. Comply with additional requirements of Division 09 Section "Floor Preparation."

D. Cleaning Products: Manufacturer's recommended cleaners, suitable for conditions.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
  - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient flooring.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 PREPARATION

- A. General: Prepare substrates according to resilient flooring manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F710. Verify that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits
  - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  - 2. Remove coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient flooring manufacturer. Do not use solvents. Use mechanical methods where recommended by flooring manufacturer.
  - 3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient flooring manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
  - 4. Moisture Testing: Perform tests recommended by manufacturer and as follows:
    - a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lbs. of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
    - b. Relative Humidity Test: Where required, using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 90 percent relative humidity level measurement.
- C. Filling: Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
  - 1. Fill or level cracks, holes and depressions 1/16 inch (1.5 mm) wide or wider and protrusions more than 1/32 inch (0.8 mm). Comply with Division 09 Section "Floor Preparation."
  - 2. Prepare and level substrates to produce transitions to comply with codes and standards, including accessibility standards. Avoid abrupt changes in plane. Construct transitions with slopes greater than 1/8-inch (3 mm) vertical in 3 feet (0.92 m).

- D. Acclimation: Do not install resilient flooring until materials are the same temperature as space where they are to be installed.
  - 1. At least 48 hours in advance of installation, move resilient flooring and installation materials into spaces where they will be installed.
- E. Preliminary Cleaning: Immediately before installation, sweep and vacuum clean substrates.

### 3.3 INSTALLATION

- A. General: Comply with manufacturer's written instructions for installing resilient flooring.
- B. Layout: Lay out resilient flooring from center marks established with principal walls, discounting minor offsets. Adjust running lengths as necessary to avoid using cut widths that equal less than one-half modular sizes at perimeter.
  - 1. Lay resilient flooring plank square with room axis in pattern indicated in Drawings.
  - 2. Select flooring from cartons in the same sequence as manufactured and packaged, if so numbered.
- C. Fitting: Scribe, cut, and fit resilient flooring to butt neatly and tightly to vertical surfaces and permanent fixtures including cabinets, pipes, outlets, and door frames. Extend resilient flooring to center of door openings.
- D. Full-Spread Adhesive Method: Adhere resilient floor to substrates using a full spread of adhesive applied to prepared and suitable substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
  - 1. Use proper trowels as recommended by manufacturer.
  - 2. Allow manufacturer's recommended open time for adhesives prior to setting resilient products.
  - 3. Adhere resilient flooring tightly to substrate.
  - 4. Roll fully adhered modular resilient flooring in both directions according to manufacturer's written instructions. Use hand roller with firm pressure where larger weighted rollers are unable to be used.
- E. Resilient Flooring Accessories: Install accessories in conjunction with resilient flooring and to comply with Division 09 Section "Resilient Base and Accessories."

### 3.4 CLEANING

- A. General: Comply with manufacturer's written instructions. Final clean resilient flooring not more than 4 days before dates of Substantial Completion.

### 3.5 REPAIRS

- A. General: Remove and replace resilient flooring and accessories that is damaged or defective.

### 3.6 PROTECTION

- A. General: Comply with manufacturer's written instructions. Protect from mars, marks, indentations, and other damage.
  - 1. Cover resilient flooring until Preliminary Acceptance/Substantial Completion. Comply with Division 09 Section "Flooring and Floor Coverings Temporary Protection."

- B. Final Protections: Provide final protection and maintain conditions in a manner acceptable to Installer to ensure modular resilient flooring is without damage and deterioration at the time of Substantial Completion/Final Acceptance.

END OF SECTION 09 65 19.23

SECTION 09 68 13 - MODULAR CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Owner-furnished modular carpeting.
  - 2. Adhesives, trowelable leveling and patching compounds, and accessories.
  - 3. Installation.
  - 4. Preparation of substrates to receive carpet products.

1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect including:
  - 1. Division 01 Section "Codes and Standards."
  - 2. Carpet and Rug Institute (CRI) including:
    - a. CRI 104 "Standard for Installation of Commercial Carpet."
    - b. CRI "CRI Carpet Installation Standard."
  - 3. Other Standards: Comply with additional codes and standards indicated. Refer to individual publishers or sources of standards for original codes and standards, including American Association of Textile Chemists and Colorists (AATCC), American National Standards Institute (ANSI), American Society of Testing and Materials (ASTM), and National Fire Protection Association (NFPA).

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For modular carpeting installation, to include in maintenance manuals. Include the following:
  - 1. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
  - 2. Precautions for cleaning materials and methods that could be detrimental to carpet.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. General: In addition to requirements of Division 01 Sections, comply with Comply with the Carpet and Rug Institute's CRI 104.
  - 1. Store products and installation materials in dry spaces, with ambient temperatures maintained within range recommended by manufacturer

## 1.6 PROJECT CONDITIONS

- A. General: Comply with the Carpet and Rug Institute's CRI 104 and manufacturer's instructions for temperature, humidity, and ventilation limitations.
- B. Environmental Limitations: Do not install carpet until ambient temperature and humidity conditions are maintained at levels recommended by carpet manufacturer during the remainder of construction.
- C. Adhesion and Bonding: Do not install carpeting over concrete slabs until slabs are sufficiently dry to bond with adhesive, and have moisture, alkalinity, and pH range recommended by carpet manufacturer.

## 1.7 WARRANTY

- A. Special Warranty for Modular Carpeting: Manufacturer agrees to repair or replace components of carpet installation that fail in materials or workmanship within specified warranty period.
  - 1. Warranty does not include deterioration or failure of carpeting due to unusual traffic, failure of substrate, vandalism, or abuse.
  - 2. Failures include, but are not limited to, the following:
    - a. Edge raveling, snags, and runs.
  - 3. Warranty Period: Not less than 5 years from date of Preliminary Acceptance/Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. General: Provide installed carpeting and accessories in permanent contact and fully bonded with properly prepared substrates, with carpet forming an unbroken surface including seams uniform across floors, carpeted surfaces free of irregularities, to comply with CRI 104 "Standard for Installation of Commercial Carpet" and "CRI Carpet Installation Standard," with edges free from separation or ravel.

### 2.2 MODULAR CARPETING

- A. Modular Carpeting Characteristics:
  - 1. Color: As indicated by manufacturer's designations in Drawings.
  - 2. Pattern: As indicated by manufacturer's designations in Drawings.
  - 3. Construction/Pile Characteristic: Engaged Tufted Pattern Loop.
  - 4. Soil/Stain Protection: As indicated by manufacturer's designations in Drawings.
  - 5. Preservative Protection: As indicated by manufacturer's designations in Drawings.
  - 6. Pile Height: 0.20-inch (5.1 mm) unless otherwise indicated.
  - 7. Primary Backing/Backcoating: Manufacturer's standard composite materials.
  - 8. Secondary Backing: Manufacturer's standard material.
  - 9. Size: As indicated by manufacturer's designations in Drawings.
  - 10. Appearance Retention Rating: Heavy traffic, not less than 3.0, unless otherwise indicated, according to ASTM D7330.
  - 11. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm 0.22 W/sq. cm according to NFPA 253.
  - 12. Radiant Panel: ASTM E648; passes.
  - 13. Smoke Density: Not more than 450 according to ASTM E662.
  - 14. Indoor Air Quality: Green Label Plus according to CDPH 01350.
  - 15. Environmental Certifications: NSF/ANSI 140 Gold.

16. Dimensional Stability: 0.10 percent or less according to ISO 2551 (AACHEN Din 54318 Test).
17. Manufacturers: Subject to compliance with requirements, provide products indicated by manufacturer's reference and descriptions.
  - a. Sizes, Colors, and Patterns: As indicated in Drawings and Color and Material books.
  - b. No substitutions permitted.

### 2.3 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by modular carpeting manufacturer.
  1. Provide materials meeting maximum moisture and pH requirements.
  2. Comply with requirements of Division 09 Section "Floor Preparation."
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining type that complies with flammability requirements for installed carpet and is recommended or provided by carpet manufacturer; capable of being applied where water vapor emissions measure up to 90 percent relative humidity (RH); compatible with substrates under conditions of service and application.
  1. Comply with additional requirements of Division 09 Section "Floor Preparation."
- C. Cleaning Products: Color-safe; dry-type, granulated or powdered, for broadcast application; as recommended or required by carpet manufacturer.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 PREPARATION

- A. General: Comply with the Carpet and Rug Institute's CRI 104 and with modular carpeting manufacturer's written installation instructions for preparing substrates.
- B. Concrete Substrates: Verify that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.
  1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  2. Remove coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient flooring manufacturer. Do not use solvents. Use mechanical methods where recommended by flooring manufacturer.
  3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient flooring manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing.



4. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft. (304.8 sq. m), and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
  - a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lbs. of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
  - b. Relative Humidity Test: Where required, using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 90 percent relative humidity level measurement.
- C. Leveling: Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates.
  1. Fill or level cracks, holes and depressions 1/8-inch (3 mm) wide or wider, and protrusions more than 1/32-inch (0.8 mm), unless more stringent requirements are required by manufacturer's written instructions.
  2. Prepare and level substrates to produce transitions to comply with codes and standards, including accessibility standards. Avoid abrupt changes in plane. Construct transitions with slopes greater than 1/8-inch (3 mm) vertical in 3 feet (0.92 m).
- D. Preliminary Cleaning: Immediately before installation, sweep and vacuum clean substrates.

### 3.3 INSTALLATION

- A. General: Comply with the Carpet and Rug Institute's CRI 104, Section 10, "Carpet Tile," and with modular carpeting manufacturer's written installation instructions.
- B. Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive.
- C. Dye Lots: Maintain dye-lot integrity. Do not mix dye lots in same area.
- D. Pile Direction Patterns: Maintain pile-direction patterns indicated on Drawings.
- E. Fitting: Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
  1. Extend carpeting into toe spaces, door reveals, open-bottomed obstructions, alcoves, and similar openings.
- F. Pattern: Install pattern parallel to walls and borders unless otherwise indicated in Drawings.

### 3.4 CLEANING

- A. General: Comply with "CRI Carpet Installation Standard" and manufacturer's written requirements.
  1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
  2. Vacuum modular carpeting using commercial machine with face-beater element.
  3. Remove yarns that protrude from modular carpet surface.

### 3.5 REPAIRS

- A. General: Remove and replace modular carpeting and accessories that are damaged or defective.

3.6 PROTECTION

- A. General: Protect installed carpet tile to comply with the Carpet and Rug Institute's CRI 104, including Section 13.7, and "CRI Carpet Installation Standard" Section 20, "Protecting Indoor Installations."
  - 1. Cover modular carpeting until Preliminary Acceptance/Substantial Completion. Comply with Division 09 Section "Flooring and Floor Coverings Temporary Protection."
- B. Final Protections: Provide final protection and maintain conditions in a manner acceptable to Installer to ensure modular carpeting is without damage or deterioration at time of Preliminary Acceptance/Substantial Completion.

END OF SECTION 09 68 13

SECTION 09 91 23.42 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  1. Water-based primers.
  2. Water-based finish coatings.
  3. Water-based floor striping coating.
  4. Surface preparation and application of prime and barrier coatings.
  5. Application of primers, paints, and coatings.
  6. Surface preparation and application of floor coatings.
  7. Application of floor coatings for floor striping.

1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect, including:
  1. Division 01 Section "Codes and Standards."
  2. Other Standards: Comply with codes and standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM), Master Painters Institute (MPI), and The Society for Protective Coatings (SSPC).

1.4 PERFORMANCE REQUIREMENTS

- A. Floor Coating Static Coefficient of Friction: Applied floor coatings capable of providing:
  1. Level Surfaces: 0.69 static coefficient of friction (SCOF) or better dry; 0.86 SCOF or better wet, per ASTM C1028.
- B. VOC Content: Comply with VOC content limitations of authorities having jurisdiction and the following, whichever is more stringent:
  1. Flat Coatings: 50 g/L or less.
  2. Nonflat Coatings: 100 g/L or less.
  3. Floor Coatings: 100 g/L or less.
  4. Industrial Maintenance Coatings: 250 g/L or less.
  5. Pretreatment Wash Primers: 420 g/L or less.
  6. Primers, Sealers, and Undercoaters: 100 g/L or less.
  7. Rust Preventative Coatings: 250 g/L or less.
  8. Specialty Primers, Sealers, and Undercoaters: 100 g/L or less.
  9. Zinc-Rich Primers: 340 g/L or less.

## PART 2 - PRODUCTS

### 2.1 PAINT PRODUCTS, GENERAL

- A. Source Limitations: Obtain each paint product from single source from single manufacturer.
- B. Interior, Institutional Low-Odor/Low VOC Primer and Primer Sealers: Water-based primer sealer with low-odor characteristics for use on substrates indicated surfaces that are subsequently to be painted with interior latex finish coats; providing resistance to moderate abrasion and corrosive conditions; and complying with VOC limitations indicated.
- C. Interior, Latex, Institutional Low Odor/Low VOC Paints: Pigmented, water-based latex paint with low-odor characteristics paint for use on substrates indicated, providing a higher level of performance in the areas of scrub resistance, burnish resistance, and ease of stain removal; and complying with VOC limitations indicated.
  - 1. Gloss and Sheen Level, Flat: Maximum gloss of five units at 60 degrees and maximum sheen of 10 units at 85 degrees when tested in accordance with ASTM D523; MPI Gloss Level 1.
  - 2. Gloss and Sheen Level, Eggshell: Gloss of 10 to 25 units at 60 degrees and sheen of 10 to 35 units at 85 degrees when tested in accordance with ASTM D523; MPI Gloss Level 3.
- D. Material Compatibility:
  - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  - 2. For each coat in a paint system, use products recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- E. Colors: As indicated by manufacturer's designations in Drawings.
- F. Manufacturers, Primers and Paints: Subject to compliance with requirements, provide products by one of the following:
  - 1. Benjamin Moore & Co.
  - 2. Sherwin Williams Company (The) (SW).
  - 3. No substitutions permitted.

### 2.2 FLOOR MARKINGS

- A. Pigmented Floor Markings: Two-component polyamine water-based epoxy; durable and abrasion-resistant; chemical resistant; tolerant of moisture emissions; resistant to disbondment from moisture vapor; no primers required; and with the following minimum characteristics:
  - 1. Adhesion: Not less than 550 lbf. /sq. ft. (26.3 kPa) when tested according to ASTM D4541.
  - 2. Abrasion Resistance: ASTM D4060 Not more than 150 mg loss according ASTM D4060 with CS17 wheel, 1000 cycles, 1 kg load.
  - 3. Flexibility: Passes ASTM D522 at 180 degree bend, 1/8-inch (3 mm) mandrel.
  - 4. Impact Resistance: Not less than 100 in. lb. (11.3 Nm) direct; 80 in. lb. (9.0 Nm) indirect.
  - 5. Pencil Hardness: Not less than H according to ASTM D3363.
  - 6. Static Coefficient of Friction (SCOF): ASTM C1028; At least 0.60 SCOF wet and dry.
  - 7. Water Vapor Perms: Not less than 5.0 grains (hr./sq.ft. in Hg) for satin.
  - 8. Hot Tire Pickup: Passes; ITM at 140 deg. F (60 deg. C).
  - 9. Sheen: Satin; 15-25 units at 60 degrees according to ASTM D523; non-reflective.
  - 10. Color: To match Safety Yellow, in satin sheen.
  - 11. VOC Content: 50 g/L or less.
  - 12. Product: Subject to compliance with requirements, provide products by one of the following:

- a. Basis of Design: ArmorSeal 8100; Sherwin Williams Co. (The).
- b. PPG Architectural Coatings, Inc. (PPG).

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. General: Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

#### 3.2 PREPARATION OF CONCRETE SURFACES

- A. Coated Floor Substrates for Markings: Prepare coated floor surfaces according to manufacturer's written instructions and recommendations.
  - 1. Do not use hydrocarbon solvents for cleaning floors where prohibited by manufacturer.

#### 3.3 PREPARATION FOR PAINTING

- A. General: Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.
- B. Preparations: Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
  - 1. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
- C. Finish Protection: Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

#### 3.4 APPLICATION OF PAINTS AND COATINGS

- A. General: Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual," including complete updates, "MPI Product Standards," and "MPI Maintenance Repainting Manual," including complete updates.
  - 1. Use applicators and techniques suited for paint and substrate indicated.
  - 2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  - 3. Sand or scuff, as appropriate for substrates to promote bond and adhesion.
- B. Priming: Prime surfaces and substrates beneath painted coatings, and behind wall coverings, perimeter fixtures, wall-mounted equipment and appliances, and other conditions.

- C. Minimum Coating Thickness: Apply materials at not less than the manufacturer's recommended spreading rate to achieve uniform surface film coverage within manufacturer's recommended range of minimum and maximum wet and dry film thicknesses.
- D. Application: Apply paints to produce uniform, opaque, smooth surface films with consistent sheen and appearance, without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

### 3.5 FLOOR MARKING APPLICATION

- A. Marking Application: Apply pigmented floor coatings for marking, striping and other patterns according to manufacturer's written application instructions and recommendations. Cover or mask areas or items not scheduled to receive floor coating application, to protect from over-application.
  - 1. Mix coating and hardener in accurate proportions required by the manufacturer. Apply within time limitations dictated by manufacturer. Apply to provide coating with slip resistance requirements indicated.
  - 2. Institute measures to restrict traffic across treated surfaces for not less than the manufacturer's written time.
  - 3. Apply to surfaces to produce dry film thicknesses (DFT) indicated.

### 3.6 REPAIRS

- A. General: At completion of construction, touch up and restore damaged painted surfaces.

### 3.7 CLEANING

- A. General: After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

### 3.8 PROTECTION

- A. Floor Coatings: Restrict traffic across treated surfaces for not less than the manufacturer's written time.
- B. Final Protections: Provide final protection and maintain conditions, in a manner acceptable to Installer, to ensure interior painting is without damage or deterioration at time of Preliminary Acceptance/Substantial Completion.

### 3.9 INTERIOR PAINTING SCHEDULE

- A. General: Provide the following paint systems for the various substrates indicated. Basis of Design products are listed in schedule.
- B. Ferrous Metal:
  - 1. Eggshell Latex Finish: 2 finish coats over a primer coat.
    - a. Primer, Primed Metal and Previously Painted Metal: SW ProMar 200 Zero VOC Interior Latex Primer B28W02600 Series White; B28W02500 Series Brite White; 1.0 mils total DFT minimum.
    - b. Finish Coats: SW ProMar 200 Zero VOC Interior Latex B20W02651 Series Eg-Shel; 1.6 mils DFT minimum each coat; 3.2 mils total DFT minimum.

- C. Non-Ferrous/Galvanized Metal:
  - 1. Eggshell Latex Finish: 2 finish coats over a primer coat.
    - a. Primer, Primed Metal and Previously Painted Metal: SW ProMar 200 Zero VOC Interior Latex Primer B28W02600 Series White; B28W02500 Series Brite White; 1.0 mils total DFT minimum.
    - b. Primer, Aluminum, Other Non-Ferrous and Galvanized Metals: SW PrepRite ProBlock Interior/Exterior Latex Primer/Sealer B51W00620 Series White Base; B51W00623 Series Deep Base; 1.4 mils total DFT minimum.
    - c. Finish Coats: SW ProMar 200 Zero VOC Interior Latex B20W02651 Series Eg-Shel; 1.6 mils DFT minimum each coat; 3.2 mils total DFT minimum.
- D. Gypsum Board Ceilings:
  - 1. Flat Latex Finish: 2 finish coats over a primer coat.
    - a. Primer: SW ProMar 200 Zero VOC Interior Latex Primer B28W02600 Series White; B28W02500 Series Brite White; 1.0 mils total DFT minimum.
    - b. Finish Coats: SW ProMar 200 Zero VOC Interior Latex B30W02651 Series Flat; 1.6 mils DFT minimum each coat; 3.2 mils total DFT minimum.
- E. Gypsum Board Walls and Partitions:
  - 1. Eggshell Latex Finish: 2 finish coats over a primer.
    - a. Primer: SW ProMar 200 Zero VOC Interior Latex Primer B28W02600 Series White; B28W02500 Series Brite White; 1.0 mils total DFT minimum.
    - b. Finish Coats: SW ProMar 200 Zero VOC Interior Latex B20W02651 Series Eg-Shel; 1.6 mils DFT minimum each coat; 3.2 mils total DFT minimum.
    - c. DFT minimum.
- F. Wood, Architectural Woodwork, Trim, Field-Finished-Opaque Finish - Latex:
  - 1. Eggshell Latex Finish: 2 finish coats over a primer.
    - a. Primer: SW ProMar 200 Zero VOC Interior Latex Primer B28W02600 Series White; B28W02500 Series Brite White; 1.0 mils total DFT minimum.
    - b. Finish Coats: SW ProMar 200 HP Zero VOC Interior Latex B20W01951 Series Extra White Base Eg-Shel; SW ProMar 200 HP Zero VOC Interior Latex B20W01950 Series High Reflective White Base Eg-Shel; or SW ProMar 200 HP Zero VOC Interior Latex B20W01953 Series Deep Base Eg-Shel; 1.7 mils DFT minimum each coat; 3.4 mils total DFT minimum.
- G. Laminate-Clad Woodwork, Millwork, and Casework, Field-Finished-Opaque Finish - Latex:
  - 1. Eggshell Latex Finish: 2 finish coats over a bonding primer.
    - a. Primer: SW Extreme Bond Primer, B51W00150 Series White; 0.9 total DFT minimum.
    - b. Finish Coats: SW ProMar 200 HP Zero VOC Interior Latex B20W01951 Series Extra White Base Eg-Shel; SW ProMar 200 HP Zero VOC Interior Latex B20W01950 Series High Reflective White Base Eg-Shel; or SW ProMar 200 HP Zero VOC Interior Latex B20W01953 Series Deep Base Eg-Shel; 1.7 mils DFT minimum each coat; 3.4 mils total DFT minimum.

### 3.10 INTERIOR FLOOR MARKING SCHEDULE

- A. General: Provide the following floor coating systems for the substrates indicated. Basis of Design products are listed in schedule.
- B. Interior Concrete Floor-Painted Floor Markings, Striping, Warning Stripes-Water-Based Epoxy:
  - 1. Two-Component Polyamine Epoxy Finish, Satin: 1 finish coat unless 1 additional coat required for coverage.

Macy's Inc. Macy's - Interior Alterations

- a. Finish Coat(s): SW ArmorSeal 8100 Water Based Epoxy Floor Coating; B70-8100 Series/B70V8100; 2.0 to 4.0 mils DFT each coat; do not exceed 5.0 mils DFT each coat.

END OF SECTION 09 91 23.42



SECTION 10 14 23.16 - INTERIOR-IDENTIFICATION PANEL SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Wall-mounted non-illuminated, non-photo-luminescent interior-identification signs, with raised braille characters and where required, handicapped accessible pictograms and iconography.
- B. Applications Include:
  - 1. Interior panel signage for:
    - a. Exit routes.
    - b. Stairs.
    - c. Electrical and other room-identification signs as required or indicated in Drawings.

1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect and authorities having jurisdiction including the following; where requirements conflict, comply with the most stringent provisions.
  - 1. Division 01 Section "Codes and Standards."
  - 2. American National Standards Institute (ANSI) including:
    - a. ANSI NEMA LD-3 "High-Pressure Decorative Laminates (HPDL)."
  - 3. Other Standards: Comply with additional codes and standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM).

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For signs to include in maintenance manuals.

1.5 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Not less than 5 years from date of Preliminary Acceptance/Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility Standard: Comply with codes and standards in effect including applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.
- B. Exits: Provide permanent interior-identification panel signage compatible with Project conditions.
  - 1. Exit Doors: Provide panel signage according to the following:
    - a. For each stair exit door that is required at path of egress travel leading to a grade-level exterior exit by means of the a stairway, a sign reading, as appropriate:
      - 1) "EXIT STAIR DOWN."
    - b. For each exit door that is required at path of egress travel to exits and within exits including intervening means of egress doors at exits at exit access corridors or exit passageways, leading directly to a grade-level exterior exit by means of and exit enclosure or an exit passageway, a sign reading, "EXIT ROUTE."
    - c. For each exit access door from an interior room or area to a corridor or hallway serving as a path of egress travel to exits and within exits including exit access corridors or exit passageways, a sign reading, "EXIT ROUTE."
    - d. For each exit door through a horizontal exit serving as a path of egress travel to exits and within exits including exit access corridors or exit passageways, a sign reading, "TO EXIT."

### 2.2 MATERIALS

- A. Acrylic or Phenolic Resin: Impervious to acids, alkalis, alcohol, solvents, abrasives, and boiling water; non-static, fire- and flame-resistant.
  - 1. Phenolic Plastic-Laminate Sheet: NEMA LD 3, flame-retardant HGF grade, not less than 0.048-inch (1.2-mm) nominal thickness.

### 2.3 ROOM-IDENTIFICATION SIGNS

- A. Room-Identification Signage: Signage with smooth, uniform surfaces; with message and characters having uniform faces and precisely formed lines and profiles; and as follows:
  - 1. Laminated-Sheet Sign: Photopolymer face sheet with raised graphics laminated to acrylic or phenolic backing sheet to produce composite sheet; engraved, sand-carved, or other subsurface processes.
    - a. Composite-Sheet Thickness: Not less than 0.125 inch (3.18 mm).
    - b. Face Colors:
      - 1) Graphics/Lettering/Characters/Pictograms: Black, unless otherwise indicated.
      - 2) Background/Field: White.
  - 2. Sign Content: As indicated in Drawings, or if not otherwise indicated, as required to comply with codes and standards in effect.
  - 3. Sign-Panel Perimeter: Finish edges smooth.
    - a. Edges: Square cut with eased edges unless otherwise indicated.
    - b. Corners: Square, with eased corners unless otherwise indicated.
  - 4. Frame: None.
  - 5. Mounting: Manufacturer's standard method for substrates indicated, for surface mounted to wall.
  - 6. Text and Typeface: Accessible raised characters and Braille.
    - a. Raised Characters: As required by codes and standards in effect. Finish raised characters to contrast with background color.
      - 1) Case: Uppercase, unless otherwise required.

- 2) Style: Sans serif; without italic, oblique, script, highly decorative, or other forms.
- 3) Format: Horizontal.
- b. Braille: Type: Contracted; Grade 2; finish Braille to match background color.
  - 1) Dimensions: Sized and spaced according to codes and standards in effect.
  - 2) Position: Below text in horizontal format, flush left or centered.
  - 3) Separation: Not less than 3/8-inch (9.5 mm) or more than 1/2-inch (12.7 mm) from other elements and perimeter of signage.
  - 4) Format: Horizontal.
- c. Size of Graphics, Lettering, Characters, and Iconography: As required by codes and standards in effect.
- d. Copy Position: Centered unless otherwise indicated or required.
- e. Minimum Clearances: Text, characters, and iconography not less than 1/2-inch (12.7 mm) from edges.
- f. Pictogram Field: Outside dimension not less than 6-inches (150 mm) high.
  - 1) Location: Top of sign, above raised characters and braille.
- g. Universal Handicapped Pictogram: International symbol of accessibility (ISA); not less than 3-inches (76 mm) unless otherwise required to be larger by codes and standards in effect.
  - 1) Face Color: Black, unless blue approximating FS Color No. 15090 in Federal Standard 595B is required.
- h. Contrasting Border/Margin: None.
- i. Sign Finish: 15- 30 percent gloss; non-glare.
7. Manufacturers: Subject to compliance with requirements, available manufacturers that may be incorporated into the Work include, but are not necessarily limited to, the following:
  - a. ASI Sign Systems, Inc.
  - b. Advance Corporation; Braille-Tac Division.
  - c. APCO Graphics, Inc.
  - d. ASE. Inc.
  - e. Best Sign Systems, Inc.
  - f. Clarke Systems.
  - g. Compliance Signs, Inc.
  - h. InPro Corporation.
  - i. Mohawk Sign Systems.
  - j. Nelson-Harkins Industries.
  - k. Vomar Products, Inc.

#### 2.4 SIGN MATERIALS

- A. Acrylic Sheet: ASTM D4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).
- B. Phenolic Plastic-Laminate Sheet: NEMA LD 3, flame-retardant HGF grade, not less than 0.048-inch (1.2-mm) nominal thickness.
- C. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.
- D. Phenolic Resin: Impervious to acids, alkalies, alcohol, solvents, abrasives, and boiling water; non-static, fire- and flame-resistant.

## 2.5 ACCESSORIES

- A. Adhesive: As recommended by sign manufacturer. Manufacturer's standard as required for secure anchorage of signage, compatible with each material joined, non-staining and permanent.
- B. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, not less than 0.045 inch (1.14 mm) thick, with adhesive on both sides.
- C. Hook-and-Loop Tape: Manufacturer's standard two-part tape consisting of hooked part on sign back and looped side on mounting surface.

## 2.6 FABRICATION

- A. General: Factory-fabricate signs and machine engrave characters and other graphic devices into panel surfaces to produce precisely formed copy, incised to uniform depth complying with codes in effect.
  - 1. Engraved Signs: Engrave through exposed face ply of acrylic or plastic-laminate sheet to expose contrasting core ply.
  - 2. Sand Carved Signs: Expose face ply of acrylic or plastic-laminate sheet to expose core ply.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 INSTALLATION

- A. General: Install signs using one of the mounting methods indicated and according to manufacturer's written instructions.
  - 1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
  - 2. Install signs so they do not protrude or obstruct according to the accessibility standard.
  - 3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
- B. Accessibility: Install signs in locations on walls as indicated on Drawings and according to the accessibility codes and standards in effect.
- C. Mounting Methods:
  - 1. Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of adhesive symmetrically to back of sign and of suitable quantity to support weight of sign after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as sign is applied and to prevent visibility of cured adhesive at sign edges. Place sign in position, and push to engage adhesive. Temporarily support sign in position until adhesive fully sets.

2. Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Keep strips away from edges to prevent visibility at sign edges. Place sign in position, and push to engage tape adhesive.
3. Hook-and-Loop Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply sign component of two-part tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage; push to engage tape adhesive. Keep tape strips 0.250 inch (6.35 mm) away from edges to prevent visibility at sign edges when sign is initially installed or reinstalled. Apply substrate component of tape to substrate in locations aligning with tape on back of sign; push and rub well to fully engage tape adhesive to substrate.

### 3.3 REPAIRS

- A. General: Remove and replace damaged or deformed signs and signs that do not comply with requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Films: Remove temporary protective coverings and strippable films as signs are installed.

### 3.4 CLEANING

- A. General: On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

### 3.5 PROTECTION

- A. Final Protection: Provide final protection and maintain conditions that ensure interior-identification panel signage is without damage or deterioration at the time of Preliminary Acceptance/Substantial Completion.

END OF SECTION 10 14 23.16

## SECTION 10 26 13 - POWER POLE PROTECTION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Protection guards for freestanding power poles.

#### 1.3 CODES AND STANDARDS

- A. General: Comply with codes and standards in effect, including:
  - 1. Division 01 Section "Codes and Standards."
  - 2. Other Standards: Comply with additional standards indicated. Refer to individual publishers or sources of standards for original documents, including American Society of Testing and Materials (ASTM) and American Welding Society (AWS).

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Source Limitations: Obtain power pole-protection products from single source from single manufacturer.

#### 2.2 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Install guards to comply with applicable provisions of codes and standards in effect including the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1.

#### 2.3 POWER POLE GUARDS

- A. Floor-Mounted Guards: Fabricated from steel plate of thickness indicated; with eased edges; fabricated with 90-degree turn to match wall condition.
  - 1. Shape: Manufacturer's standard radius, cee-shaped channel, or other suitable shape to fit conditions.
    - a. Finish: Smooth.

2. Guard Height (Tall): Not less than 12 inches (305 mm).
3. Inside Clearance Facing Power Pole: Not less than 4-inches (102 mm).
4. Upright Guard Plate Thickness: Not less than 0.1875-inch (4.76 mm) (7-gauge).
5. Base Plate Thickness: Not less than upright guard thickness unless thicker material is required.
6. Baseplate: Predrilled steel, to accept not less than 4 anchors of type and size indicated.
7. Mounting: Post-installed anchors through factory-drilled mounting holes.
8. Products: Subject to compliance with requirements, provide one of the following:
  - a. H-3270 Rack Protector; H-3722 Anchor Kit; U-Line, Inc.
  - b. P-12 Pallet Rack Upright Protector; Handle-It, Inc.
  - c. G6-12 Structural Rack Guard; Vestil Manufacturing.
  - d. Pallet Rack Column Guards; Worldwide Material Handling (WWMH), Inc.

## 2.4 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- B. Anchors, General: Capable of sustaining, without failure, a load equal to 4 times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
- C. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors; with working capacity indicated, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 or ICC-ES AC193 for expansion anchors.
  1. Material: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
- D. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- E. Corners and Seams: Weld corners and seams continuously to comply with the following:
  1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  2. Obtain fusion without undercut or overlap.
  3. Remove welding flux before finishing.

## 2.5 FABRICATION

- A. General: Fabricate protection according to requirements indicated for design, performance, dimensions, and sizes, including thicknesses of components. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32-inch (1 mm) unless otherwise indicated.

## 2.6 METAL FINISHES

- A. General: Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Finishes: Finish metal surfaces according to manufacturer's requirements. Select from one of the following finishes.
- C. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard baked-enamel finish consisting of prime coat and thermosetting topcoat, with a minimum dry film thickness of 1 mil (0.025 mm) for topcoat.
  1. Color: Manufacturer's standard Safety Yellow.

- D. Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard thermosetting polyester or acrylic urethane powder coating with cured-film thickness not less than 1.5 mils (0.04 mm). Prepare, treat, and coat metal to comply with resin manufacturer's written instructions.
  - 1. Color: Manufacturer's standard Safety Yellow.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. General: Examine substrates and floor areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

#### 3.2 PREPARATION

- A. General: Complete operations, including flooring preparations and installation of power poles, prior to installation of protection.
- B. Preparatory Cleaning: Before installation, clean substrate to remove dust, debris, and loose particles.

#### 3.3 INSTALLATION

- A. Installation: Install protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with defects that might be visible in the finished Work.
  - 1. Install guards with rear upright edge not less than 2 inches (51 mm) from face of power pole. Coordinate dimension to provide sufficient clearance to permit unobstructed access to power pole base and base access panels.
  - 2. Locate guards so as not to obstruct accessible paths or reduce clearances along accessible routes.
- B. Accessories: Provide mounting anchors and other accessories required for a complete installation. Provide anchoring devices and suitable locations to withstand imposed loads.

#### 3.4 CLEANING

- A. General: Immediately after completion of installation, clean protection and accessories using cleaning agents recommended by manufacturer or otherwise suitable for finishes.

#### 3.5 PROTECTION

- A. Final Protections: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure interior joint sealants are without damage and deterioration at the time of Preliminary Acceptance/Substantial Completion.

END OF SECTION 10 26 13



## SECTION 10 44 16 - FIRE EXTINGUISHERS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes
  1. Portable, hand-carried fire extinguishers.
  2. Mounting brackets.
  3. Identification.

#### 1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

#### 1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
  1. Failures include, but are not limited to, the following:
    - a. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period.
    - b. Faulty operation of valves or release levers.
  2. Warranty Period: Not less than 5 years from date of Preliminary Acceptance/Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
  1. Provide fire extinguishers approved, listed, and labeled by UL and FM Global.

#### 2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each mounting indicated.

1. Source Limitations: Obtain fire extinguishers, fire-protection cabinets, and accessories, from single source from single manufacturer.
  2. Valves: Manufacturer's standard nickel-plated, polished-brass body.
  3. Handles and Levers: Manufacturer's standard stainless steel.
  4. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B.
  5. Manufacturers: Subject to compliance with requirements, provide one of the following:
    - a. Basis of Design: Larsen's Manufacturing Company.
    - b. Ansul Incorporated; Tyco International Ltd.
    - c. Kidde Commercial Division; subsidiary of Kidde plc.
    - d. J. L. Industries, Inc.; division of Activar Construction Products Group.
- B. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 4-A:60-B:C, 10-lb (4.5-kg), nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container; for Types A, B, and C fires, as classified by NFPA 10.

### 2.3 MOUNTING BRACKETS

- A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with red or black baked-enamel finish.
1. Source Limitations: Obtain mounting brackets and fire extinguishers from single source from single manufacturer.
  2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Basis of Design: Bracket 5525; Larsen's Manufacturing Company.
    - b. Ansul Incorporated; Tyco International Ltd.
    - c. Kidde Commercial Division; subsidiary of Kidde plc.
    - d. J. L. Industries, Inc.; division of Activar Construction Products Group.
- B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red lettered decals applied to mounting surface.
    - a. Orientation: **Vertical**, unless otherwise required by authorities having jurisdiction.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. General: Examine areas for fire extinguisher installations to verify actual locations of mounting heights and clearances for accessibility.
1. Examine fire extinguishers for charging and tagging.
  2. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Proceeding: Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Commencement: Commencement of work indicates acceptance of conditions and responsibility for corrections.

### 3.2 INSTALLATION

- A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
  - 1. Install fire extinguishers to comply with NFPA 10 in locations indicated at mounting heights required. Maintain clearances for accessibility; avoid extinguishers projecting into accessible routes or other clear aisle ways; adjust locations where required to maintain clearances.
- B. Mounting Brackets: Fasten and anchor mounting brackets to surfaces, square and plumb, at locations indicated or otherwise required.
  - 1. Bracket-Mounted Fire Extinguisher Weighing 40 lbs. (18 kg) or less: At height required by authorities having jurisdiction, but not more than 54 inches (1372 mm) above finished floor to top of unit.
- C. Identification: Install and permanently affix identification decals or placards above bracket-mounted fire extinguishers, in highly visible location above units.

### 3.3 REPAIRS

- A. General: Replace fire extinguishers damaged, defective, undercharged, or deteriorated beyond successful repair by minor repair procedures or charging. Use only materials and procedures recommended by fire extinguisher manufacturer.
- B. Tagging: Replace missing, incomplete, or damaged tagging.

### 3.4 PROTECTION

- A. Final Protection: Provide final protections and maintain conditions that ensure fire extinguishers is without damage or deterioration at the time of Preliminary Acceptance/Substantial Completion.

END OF SECTION 10 44 16

SECTION 23 01 00 - GENERAL - HVAC

PART 1 GENERAL

1.1 REFERENCE

- A. Drawings and general provisions of the Contract, including General and Supplementary conditions and Divisions 01 Specifications Sections, apply to this Section.

1.2 SCOPE

- A. The Contractor shall conform to all provisions of Division 23 (as included) in each of their respective contracts, and each is to consider the word "Contractor" to mean themselves.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable.

END OF SECTION 23 01 00

SECTION 23 01 05 - HVAC GENERAL PROVISIONS

PART 1 GENERAL

1.1 REFERENCE

- A. Drawings and general provisions of the Contract, including General and Supplementary conditions and Divisions 01 Specifications Sections, apply to this Section.

1.2 GENERAL REQUIREMENTS

- A. Furnish all labor, materials, tools, incidentals and details necessary to provide a complete mechanical system, ready to operate, including but not limited to the items listed under the Mechanical Specification Indexes.
- B. Include any minor details essential to successful operation and any other items specified or shown on the Drawings.
- C. The Contractor is required to read the Specifications covering all branches of the work and will be held responsible for coordination of his work with work performed under all other Contracts.
- D. The Contractor is required to visit the site and fully inform himself concerning all conditions affecting the scope of his work. Failure to visit the site shall not relieve the Contractor from any responsibility in the performance of his Contract.
- E. The Contractor should feel free to contact the Architect immediately if there is any question regarding the meaning or intent of either Plans or Specifications, or if he notices any discrepancies or omissions in either Plans or Specifications.
- F. Other than minor adjustments shall be submitted to the Architect for approval before proceeding with the work.
- G. The Contractor shall submit on his letterhead, along with the Bid, the manufacturer's name and the names of all Subcontractor's to whom he intends to sublet the work. If the Contractor fails to provide this information with the Bid, the Architect shall have the right to select the manufacturers and Subcontractor's with no additional charge.
- H. Scheduling of all work performed by the Contractor shall be completely coordinated with the Architect.
- I. All material hoisting by trade involved.
- J. Arrangements for storage of tools and material, removal of debris, and interruptions of services shall be made with Architect.
- K. Consult with the Architect regarding any points where interference is likely to occur and follow dimensions carefully where given on the Drawings. Pay particular attention to minimum clear heights when indicated on the Drawings.
- L. It is mandatory that dust and debris be held to a minimum. The Contractor shall provide drop cloths, screens, curtains, etc., to protect the Owners stock, equipment and personnel from dust and dirt during the course of his work. All damage to existing construction or finishes shall be repaired

by the Contractor upon removal of dirt and dust protection devices. All dirt, dust and other protection devices shall be approved by Architect before any work is started in the area involved.

- M. The Contractor, insofar as this Contract is concerned, shall at all times keep the premises and the building in a neat and orderly condition.
- N. At the completion of the project, the Contractor shall promptly clean up and remove from the site, all debris and excess materials.

### 1.3 DRAWINGS

- A. Consult all Contract Drawings which may affect the locations of any equipment, apparatus, ductwork and make minor adjustments in location to secure coordination.
- B. Duct layout is schematic and exact locations shall be determined by structural and other conditions and verified in the field. This shall not be construed to mean that the design of the system may be changed, it refers only to the exact location of ductwork to fit into the building as constructed, and to coordination of all work with piping and equipment included under other Divisions of the Specifications.
- C. The layout shown on the Drawings is based on a particular make of equipment. If another make of equipment is used which requires modifications or changes of any description from the Drawings or Specifications, this Contractor shall be responsible for making all such modifications and changes, including those involving other trades, as a part of this Contract and the cost thereof shall be included in his Bid. In such case, the Contractor shall submit Drawings and Specifications showing all such modifications and changes prior to starting work, which shall be subject to the approval of the Architect.
- D. Macy's and the Architect reserves the right to make minor changes in the location of duct work and air devices up to the time of rough-in without additional cost to Macy's.
- E. Where certain grades and/or elevations are given on the Drawings, they have been obtained from the best information available; however, they are not guaranteed. The Contractor MUST assume the full responsibility of verifying present elevations in the field and making any adjustments as may be necessary, all of which must be included in his Bid Price.
- F. Due to the scale of the Drawings, it is impossible to show all offsets and transitions which may be required. The Contractor shall carefully investigate the conditions affecting all work and shall furnish all elbows, fittings, transitions, etc., required to accomplish the desired result at no additional cost to Macy's.
- G. Install all work as close as possible to walls, ceilings, struts, members, etc., consistent with the proper space for covering, access, etc., so as to occupy the minimum of space.
- H. Actual dimensions shown on the Drawings and field dimensions shall take precedence over scaled dimensions.

### 1.4 PERMITS, INSPECTIONS AND CODES

- A. The General Contractor will obtain the general building permit. Any other permits required for the project will be obtained by the Contractor performing the work. Fees will be included in the bid price.

- B. Completed installations shall conform with all applicable Federal, State and Local Laws, Codes and Ordinances, including but not limited to the latest editions of the following:
  - 1. Local State Building Code (ICC).
  - 2. Local City Code of Ordinances.
  - 3. National Electrical Code, Bulletin No. 70, National Fire Protection Association.
  - 4. Air Conditioning and Ventilating, Bulletin No. 90 A, National Fire Protection Association.
  - 5. Ventilation Control and Fire Protection of Commercial Cooking Operations, Bulletin No. 96, National Fire Protection Association.
  - 6. Life Safety Code, Bulletin No. 101, National Fire Protection Association.
  - 7. ICC Mechanical Code.
  - 8. All Work Under Jurisdiction of Local Fire Marshal shall conform to requirements set forth by Fire Marshal's Office and National Fire Protection Association.
- C. Nothing contained in the Plans and Specifications shall be construed to conflict with these laws, codes and ordinances and they are hereby made a part of these Specifications.

#### 1.5 ENERGY CODE

- A. The Mechanical System must comply with all requirements of the Local State Code for Energy Conservation (ICC Energy Code). This includes, but is not limited to, efficiencies, power factors, insulation thickness, etc.

#### 1.6 RECORD DOCUMENTS

- A. The Contractor shall keep an accurate record of all deviations from Contract Drawings and Specifications. He shall neatly and correctly enter in colored pencil any deviations on Drawings affected and shall keep the Drawings available for inspection. Extra sets of Drawings will be furnished for this purpose.
- B. At the completion of project and before final approval, make any final corrections to Drawings and certify to the accuracy of each print by signature and deliver same to the Architect.
- C. At the completion of project provide one (1) CD containing scanned images of the marked-up drawings in PDF format and deliver to the Architect.

#### 1.7 SUPERVISION

- A. The Contractor shall have in charge of the work, on the job during construction, a competent superintendent experienced in the work installed under this Contract.

#### 1.08 UNACCEPTABLE WORK AND OBSERVATION REPORTS

- A. Work shall be unacceptable when found to be defective or contrary to the Plans, Specifications, Codes specified or accepted standards of good workmanship.

- B. The Contractor shall promptly correct all work found unacceptable by the Engineer or the Architect whether observed before or after substantial completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such unacceptable work, including compensation for the Engineer's or Architect's additional services made necessary thereby.
- C. During the course of construction, the Architect and Engineer will prepare "Observation Reports" with a list of items found to be in need of correction. All items listed shall be corrected by the Contractor. A space is provided on the form for the Contractor to note the completion of each item. All prior "Observation Report" items must be completed, the lists signed and returned to the Architect prior to making the final inspection. After the final list is issued, the same procedure will apply.

#### 1.09 FINAL INSPECTION

- A. When the Contractor determines all work is completed and working properly per the Contract Documents, he shall request a "final" inspection by the Architect and Engineer in writing. If more than one reinspection is required after this final inspection, the Contractor shall bear all additional costs including compensation for the Architect's and Engineer's additional services made necessary thereby. A final inspection will not be made until Operating and Maintenance Manuals and Air Balance Reports are submitted and approved and all prior "Observation Report" punch lists completed, signed and returned to the Architect.
- B. As part of the final checkout of the project, the Engineer will be checking out the operation of the various systems. The Contractor shall provide such assistance as required (including manpower and tools) to start and stop the various systems, open and close valves etc. and simulate summer, winter and other temperature control sequences. The Contractor (not the Engineer) is responsible to turn on the systems and demonstrate they are operating properly.

#### 1.10 GUARANTEE

- A. The Contractor is responsible for all defects, repairs and replacements in materials and workmanship, for a period of one (1) year after final payment is approved by Architect.

#### PART 2 PRODUCTS

Not Applicable.

#### PART 3 EXECUTION

Not Applicable.

END OF SECTION 23 01 05



SECTION 23 01 10 - MANUFACTURER'S DRAWINGS

PART 1 GENERAL

1.1 REFERENCE

- A. Drawings and general provisions of the Contract, including General and Supplementary conditions and Divisions 01 Specifications Sections, apply to this Section.

1.2 SCOPE

- A. The Contractor shall submit to the Architect for review, within two weeks after date of contract, ten (10) copies of manufacturer's drawings, wiring diagrams, pump and fan curves or data. The Engineer will review the Contractor's shop drawings and related submittals (as indicated below) with respect to the ability of the detailed work, when complete, to be a properly functioning integral element of the overall system designed by the Engineer. Before submitting a shop drawing or any related material to the Engineer, The Contractor's shall: review each such submission for conformance with the means, methods, techniques, sequences, and operations of construction, and safety precautions and programs incidental thereto, all of which are the sole responsibility of the Contractor's; approve each such submission before submitting it; and so stamp each such submission before submitting it. The Engineer shall assume that no shop drawing or related submittal comprises a variation unless the Contractor's advises the Engineer otherwise via a written instrument which is acknowledged by Engineer in writing. The shop drawings and related material (if any) called for are indicated below:

Heating, Ventilating and Air Conditioning Contract

Registers, Grilles and Diffusers

- B. The Engineer shall return shop drawings and related materials with comments provided that each submission has been called for and is stamped by the Contractor as indicated above. The Engineer shall return without comment material not called for or which has not been approved by the Contractor.
- C. The Contractor shall furnish equipment shop drawings which will indicate power hook up and control connections as required for mechanical equipment. "Stock" wiring diagrams are NOT ACCEPTABLE.
- D. The manufacturer shall provide a statement on submittals that equipment furnished complies with the Energy Code. This previously relates to high efficiency motors, EER's, COP's, etc. If this is not done, submittals will be rejected.
- E. The Contractor shall create 3-dimensional (3D) coordination model with ability to output 1/4" scale, color coded coordination drawings in PDF and DWG formats for use in coordinating all above ceiling work, including but not limited to existing and new Structure, Plumbing, Fire Protection, Electrical, and Technology scope with the layout of air distribution and piping system. The Contractor shall confirm existing structural conditions upon completion of demolition and abatement of all items to be removed by completing an "As-Built" survey using 3D laser scanning technology compatible with the 3D modeling software to be used in creating the coordination model and drawings. Lighting, ceiling systems (including grid), ceiling access doors, emergency shower heads, ceiling mounted projectors and all other ceiling mounted items and other scope impacting this coordination shall be shown to verify no conflicts exist.

The contractor shall provide coordination drawings to A/E within 30 days of award of Contract to Subcontractor responsible for HVAC (Division 23) scope. The Contractor is responsible for providing information as to size, elevation and location proposed for all components, and for coordination of work of all Subcontractors. Final resolution of all items to be determined at project meetings held by the Architect.

- F. Engineer's review of manufacturer's drawings or schedules shall not relieve the Contractor from compliance with the requirements of the plans and specifications.

### 1.3 QUANTITIES

- A. Items may be referred to in singular or plural on Plans and Specifications. The Contractor is responsible for determining quantity of each item.

### PART 2 PRODUCTS

Not Applicable

### PART 3 EXECUTION

Not Applicable

END OF SECTION 23 01 10

SECTION 23 05 29 - HANGERS AND SUPPORTS

PART 1 GENERAL

1.1 SCOPE

- A. Furnish and install necessary hangers and supports to properly support all ductwork and to maintain uniform elevation.
- B. Ceiling grid systems shall not be supported from ductwork, and vice versa. Each utility system and the ceiling grid system shall be a separate installation and each shall be independently supported from the building structure. Where interference's occur, provide trapeze type hangers or other suitable supports where they will not interfere with access to equipment, dampers and other appurtenances requiring servicing.

PART 2 PRODUCTS

- 2.1 All duct hangers shall be in accordance with SMACNA standards.

PART 3 EXECUTION

- 3.1 Support all ductwork from structure above.

END OF SECTION 23 05 29

SECTION 23 05 49 - SEISMIC CONTROLS AND RESTRAINTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Not Applicable

1.2 SUMMARY

- A. This section includes the design, application and installation of seismic and wind restraints for mechanical equipment and components and are in addition to requirements specified elsewhere for the support and attachment of mechanical equipment and components.
- B. The materials, systems and professional engineering services specified in this section shall be purchased from a single seismic restraint manufacturer to assure sole source responsibility of the performance for the seismic restraints used.
- C. The Contractor shall coordinate all information on mechanical equipment and components with the seismic and wind restraint manufacturer to ensure that all components requiring seismic and wind restraints have been properly addressed.

1.3 DEFINITIONS

- A. Seismic Restraint: A structural support element such as a metal framing member, a cable, an anchor bolt or stud, a fastening device, a dampening device or an assembly of these items used to transmit seismic forces from an item of equipment or system to building structure and to limit movement of item during a seismic event.
- B. IBC: International Building Code.

1.4 SUBMITTALS

- A. Product Data: Illustrate and indicate style, material, strength, fastening provisions, and finish for each type and size of seismic-restraint component used.
  - 1. Tabulate types and sizes of seismic restraints showing design data for each restraint including specific anchorage details.
  - 2. Annotate to indicate application of each product submitted and compliance with requirements.
  - 3. Utilize a seismic and wind restraint schedule. Each and every mechanical component shall be listed in the schedule as well as all appropriate information for each component.
- B. Shop Drawings: Indicate materials and dimensions and identify hardware, including attachment and anchorage devices, signed and sealed by a qualified Registered Professional Engineer with a minimum of five (5) years working experience in this field. Include the following:
  - 1. Fabricated Supports: Representations of field-fabricated supports not detailed on Drawings.
  - 2. Seismic Restraints: Detail anchorage and bracing not defined by details or charts on Drawings. Include the following:
    - a. Design Analysis: To support selection and arrangement of seismic and wind restraints. Include calculations of combined tensile and shear loads.

- b. Details: Detail fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events.
- C. Coordination drawings: Show coordination of seismic bracing for mechanical components with other systems and equipment in the vicinity, including other supports and seismic/ restraints.
- D. Field quality-control test reports.

## 1.5 QUALITY ASSURANCE

- A. Comply with seismic-restraint requirements in the International Building Code unless requirements in this Section are more stringent.

## 1.6 PROJECT CONDITIONS

- A. Seismic-Restraint Loading Project Conditions;
  - 1. Seismic restraints to be designed per codes and standards in effect including Chapter 16, Structural Design and SEI/ASCE 7.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to manufacturer's specified.
  - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturer's specified.
    - a. Kinetics Noise Control
    - b. Allied Support Systems
    - c. Loos & Co., Inc.
    - d. Michigan Hanger Co. Inc.
    - e. National Pipe Hanger Corp.
    - f. Seasafe, Inc.
    - g. Vibro-Acoustics
    - h. Mason Industries

## 2.2 SOURCE OF MATERIALS

- A. All seismic restraints and combination restraint/vibration isolation materials specified herein shall be provided by a single manufacturer to assure sole source responsibility for the proper performance of the materials used.
- B. Mechanical anchor types and sizes are to be per the design data as provided by the seismic restraint manufacturer.
- C. All seismic restraint assemblies should meet the following minimum requirements:
  - 1. Impact surface should have a high quality elastomeric facing so to ensure that no metal-to-metal contact can occur.
  - 2. Resilient material should be easy to visually inspect for damage and be replaceable if necessary.
  - 3. Resilient material used in snubber assemblies to be a minimum of 0.25" (6 mm) thick.
  - 4. Resilient material used in snubber grommets to be a minimum of 0.12" (3 mm) thick.
  - 5. Assembly must be designed to offer seismic restraint in all directions, unless otherwise noted.
  - 6. Clearance between resilient material and contacting isolated equipment surface must not exceed 0.25" (6 mm).

## 2.3 SEISMIC RESTRAINT TYPES

- A. Type 1 Coil Spring Isolator Incorporated Within a Steel Housing
  - 1. Spring isolators shall be seismic control restrained spring isolators, incorporating a single or multiple coil spring element, having all of the characteristics of free standing coil spring isolators as specified in the vibration isolation portion of this specification. Springs shall be restrained using a housing engineered to limit both lateral and vertical movement of the supported equipment during an earthquake without degrading the vibration isolation capabilities of the spring during normal equipment operating conditions.
  - 2. Vibration isolators shall incorporate a steel housing and neoprene snubbing grommet system designed to limit motion to no more than 1/4" (6 mm) in any direction and to prevent any direct metal-to-metal contact between the supported member and the fixed restraint housing. The restraining system shall be designed to withstand the seismic design forces in any lateral or vertical direction without yield or failure. Where the capacity of the anchorage hardware in concrete is inadequate for the required seismic loadings, and adapter base plate to allow the addition of more or larger anchors will be fitted to fulfill these requirements. In addition to the primary isolation coil spring, the load path will include a minimum 1/4" (6 mm) thick neoprene pad.
  - 3. Spring elements shall be color coded or otherwise easily identified. Springs shall have a lateral stiffness greater than 1.2 times the rated vertical stiffness and shall be designed to provide a minimum of 50% overload capacity. Non-welded spring elements shall be epoxy powder coated and shall have a minimum of a 1000 hour rating when tested in accordance with ASTM B-117.
  - 4. To facilitate servicing, the isolator will be designed in such a way that the coil spring element can be removed without the requirement to lift or otherwise disturb the supported equipment.
- B. Type 2 Coil Spring Isolator Incorporated Within a Steel Housing
  - 1. Spring isolators shall be seismic control restrained spring isolators, incorporating one or more coil spring elements, having all of the characteristics of free standing coil spring isolators per the

vibration isolation section of this specification for equipment which is subject to load variations and/or large external forces. Isolators shall consist of one or more laterally stable steel coil springs assembled into fabricated welded steel housings designed to limit movement of the supported equipment in all directions.

2. Housing assembly shall be made of fabricated steel members and shall consist of a top load plate complete with adjusting and leveling bolts, adjustable vertical restraints, isolation washers, and a bottom load plate with internal non-skid isolation pads and holes for anchoring the housing to the supporting structure. Housing shall be hot dipped galvanized for outdoor corrosion resistance. Housing shall be designed to provide a constant free and operating height within 1/8" (3 mm).
3. The isolator housing shall be designed to withstand the project design seismic forces in all directions.
4. Coil spring elements shall be selected to provide static deflections as required by the project. Spring elements shall be color coded or otherwise easily identified. Springs shall have a lateral stiffness greater than 1.2 times the rated vertical stiffness and shall be designed to provide a minimum of 50% overload capacity. Non-welded spring elements shall be epoxy powder coated and shall have a minimum of a 1000 hour rating when tested in accordance with ASTM B-117.

C. Type 3 Coil Spring Isolator Incorporated Within a Steel Housing

1. Spring isolators shall be lateral restrained spring isolators, incorporating a single coil spring element, having all of the characteristics of free standing coil spring isolators as previously specified. Springs shall be assembled into a welded steel housing engineered to limit lateral movement of supported equipment during an earthquake without degrading the vibration isolation capabilities of the spring during normal operating conditions.
2. Vibration isolators shall incorporate a steel angle and plate motion limiting assembly and steel coil spring, designed as a system to accept a force in any lateral direction in excess of the design seismic requirement for the isolator without yield or failure. Isolator shall limit lateral movement of the equipment to less than 1/4" (6 mm) in any direction. The lateral limit stop shall incorporate a neoprene grommet to prevent the potential for metal-to-metal contact. The vibration isolation element shall include a 1/4" (6 mm) thick ribbed neoprene noise stop pad, positioned outside of the housing anchorage path. The housing shall incorporate drilled holes for attachments to the supporting structure.

D. All Direction Neoprene Isolator

1. Vibration Isolators shall be neoprene, molded from oil resistant compounds, designed to operate within the strain limits of the isolator so as to provide the maximum isolation and longest life expectancy possible using neoprene compounds. Isolators shall include encapsulated cast-in-place top steel load transfer plate for bolting to equipment and a steel base plate with anchor holes for bolting to the supporting structure. Ductile iron or cast aluminum components are not acceptable alternatives and shall not be used due to brittleness when subjected to shock loading.
2. Isolator shall be capable of withstanding the design seismic loads in all directions with no metal-to-metal contact.
3. Isolator shall have minimum operating static deflections as required by the project and shall not exceed published load capacities.

E. All Direction External Seismic Snubber Assembly

1. Equipment shall be restrained against excessive movement during a seismic event by the use of 3-axis resilient snubbers, designed to withstand the project required seismic forces.

2. Snubbers shall be of welded steel construction and shall be attached to the equipment structure and equipment in a manner consistent with anticipated design loads. Snubbers shall limit lateral and vertical equipment movement at each snubber location to a maximum of ¼" (6 mm) in any direction.
3. Snubbers shall include a minimum ¼" (6 mm) thick resilient neoprene pads to cushion any impact and to avoid any potential for metal-to-metal contact. Maximum neoprene bearing pressure shall not exceed 1,500 pounds/sq. inch (10.4 N/sq. mm). Snubber shall be installed only after the isolated equipment is mounted, piped, and operating so as to ensure that no contact occurs during normal equipment operation.

F. All Direction Lateral External Seismic Snubber Assembly

1. Equipment shall be restrained against excessive lateral movement during a seismic event by the use of 2-axis horizontal resilient snubbers, designed to withstand the project required seismic forces.
2. Snubbers shall be of welded steel construction and shall be attached to the equipment structure and equipment in a manner consistent with anticipated design loads. Snubbers shall limit lateral equipment movement at each snubber location to a maximum of ¼" (6 mm).
3. Snubbers shall include a minimum of ¼" (6 mm) thick resilient neoprene pads to cushion any impact and to avoid any potential for metal-to-metal contact. Snubber shall be installed only after the isolated equipment is mounted, piped, and operating so as to ensure that no contact occurs during normal equipment operation.

G. Two-Axis External Seismic Snubber Assembly

1. Equipment shall be restrained against excessive vertical and horizontal movement during a seismic event by the use of 2-axis resilient snubbers, designed to withstand the project required seismic forces. A minimum of four (4) snubbers are to be used at each equipment installation, oriented to effectively restrain the isolated equipment in all three directions.
2. Snubbers shall be of welded steel construction and shall be attached to the equipment structure and equipment in a manner consistent with anticipated design loads. Snubbers shall limit lateral and vertical equipment movement at each snubber location to a maximum of ¼" (6 mm) in any direction.
3. Snubbers shall include resilient neoprene pads with a minimum thickness of ¼" (6 mm) to cushion any impact and to avoid any potential for metal-to-metal contact. Snubber shall be installed only after the isolated equipment is mounted, piped, and operating so as to ensure that no contact occurs during normal equipment operation.

H. Single-Axis External Seismic Snubber Assembly

1. Equipment shall be restrained against excessive horizontal one-axis movement during a seismic event by the use of single-axis resilient snubbers, designed to withstand the project required seismic forces. A minimum of four (4) snubbers are to be used at each equipment installation, oriented to effectively restrain the isolated equipment in all lateral directions.
2. Snubbers shall be of welded steel construction and shall be attached to the equipment structure and equipment in a manner consistent with anticipated design loads. Snubbers shall limit lateral equipment movement at each snubber location in the direction of impact to a maximum of ¼" (6 mm).
3. Snubbers shall include resilient neoprene pads with a minimum thickness of ¼" (6 mm) to cushion any impact and to avoid any potential for metal-to-metal contact. Snubber shall be installed only



after the isolated equipment is mounted, piped, and operating so as to eliminate any contact during normal equipment operation.

I. Cable Restraints For Suspended Equipment

1. Seismic wire rope cable restraints shall consist of steel wire strand cables, sized to resist seismic loads, arranged so to offer seismic restraint capabilities for suspended equipment in all lateral directions.
2. End connection fittings shall be designed to swivel in order to ensure proper cable alignment and to avoid bending of rope. Protective thimbles shall be used at connection points so to eliminate bending cable across sharp edges.
3. Anchoring hardware at each end of the cable shall be designed so to exceed the working project design load of the wire cable by a minimum of 50 percent.

J. Coil Spring Isolator Incorporated Within a Ductile Iron or Cast Aluminum Housing

1. Cast iron or aluminum housing are brittle when subjected to shock loading and are therefore not approved for seismic restraint applications.

PART 3 EXECUTION

3.1 SEISMIC-RESTRAINT

- A. Comply with ASHRAE 1 for installation requirements, except as specified in this Article.
- B. Install seismic-restraint components per manufacturer's written instructions using methods approved by the evaluation service providing required submittals for component.
- C. Strength of Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb. (90kg).
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten mechanical items and their supports to building structural elements by the methods specified in their individual specification sections.

3.2 RESTRAINT OF MECHANICAL EQUIPMENT AND SYSTEMS

- A. Provide seismic and wind restraints for all mechanical equipment including but not limited to:
  1. A/C Units
  2. Air Distribution Boxes and Air Valves
  3. Rooftop Units
  4. Air Separators
  5. Cabinet Heaters
  6. Self Contained A/C Units
  7. Condensing Units
  8. Ductwork
  9. Fans (all types)
  10. Piping

3.3 INSPECTION

- A. the Contractor shall notify the local representative of the seismic and wind restraint materials manufacturer prior to installing any seismic restraint devices. The Contractor shall seek the representative's guidance in any installation procedures with which he is unfamiliar.
- B. The local representative of the seismic and wind restraint materials manufacturer shall conduct periodic inspections of the installation of the materials herein specified, and shall report in writing to the Contractor any deviations from good installation practice observed.
- C. Upon completion of the installation of all seismic and wind restraint devices herein specified, the local representative of the seismic restraint manufacturer shall inspect the completed system and report in writing any installation errors, improperly selected devices, or other fault in the system which could affect the performance of the system.
- D. The Installing Contractor shall submit a report upon request to the building owner or his representative, including the manufacturer's representative's final report, indicating that all seismic and wind restraint material has been properly installed, or steps to be taken by the Contractor to properly complete the seismic restraint work as per the specifications.

#### 3.4 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

- A. Make flexible connections in runs of piping, ductwork, etc. where they cross expansion and seismic-control joints, where adjacent sections or branches are supported by different structural elements, and where they terminate with connection to mechanical equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

#### 3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing: Test pullout resistance of seismic anchorage devices.
  - 1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
  - 2. Schedule test with Architect before connection anchorage device to restrained component (unless postconnection testing has been approved), and with at least seven days' advance notice.
  - 3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
  - 4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
  - 5. Test to 90 percent of rated proof load of device.
  - 6. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.

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C. Record test results.

END OF SECTION 23 05 49

## SECTION 23 05 93 - TESTS AND ADJUSTMENTS

### PART 1 GENERAL

#### 1.1 REFERENCE

- A. Drawings and general provisions of the Contract, including General and Supplementary conditions and Divisions 01 Specifications Sections, apply to this Section.

#### 1.2 SCOPE

- A. After work has been completed but before pipe covering has been applied, the Contractor shall test and adjust the systems he has installed.
- B. The Contractor shall adjust all his equipment in the mechanical system to obtain proper operation and shall demonstrate to Macy's, the Architect and the Engineer that the entire system will function properly.

### PART 2 PRODUCTS

Not Applicable

### PART 3 EXECUTION

#### 3.1 Balancing Air Systems:

- A. The Contractor shall procure the services of an independent company which specializes in the testing and balancing of air systems. All balancing work shall be done under the direct supervision of a qualified Heating and Ventilating Engineer. It shall be the responsibility of the Contractor to make all necessary arrangements with the Balancing Company for balancing the air systems after all equipment, ductwork, outlets, piping and accessories have been installed. A detailed report on all balancing work shall be prepared and submitted, in triplicate, to the Architect for review. Each copy of the report shall be dated, signed by the supervising Engineer of the Balancing Company and bound in a suitable cover. The Balancing Company shall be selected by the Contractor from the following qualified firms:
  - 1. Any member of the Associated Air Balance Council or NEBB.
- B. Scope of Work
  - 1. Balance all new and existing air devices shown on the plans.
- C. Balancing procedures and report to be in accordance with procedures set forth by the Associated Air Balance Council. Report shall also include fan curves for all equipment and written procedures for balancing each piece of equipment.
- D. Balance reports shall include starter element sizes, and amperage ratings for each motor. If starter elements amperage rating is more than 10 percent greater or less than motor nameplate amperage, the Contractor shall inform the Electrical Contractor to furnish and install proper size elements. Balance report shall include the corrected proper size starter element sizes and amperage ratings.
- E. Balance Contractor shall conduct testing of each temperature zone over a set time period to confirm that required space temperatures are achieved.

- F. Balance Contractor shall report by letter to the Architect and Engineer on preliminary results of balancing before the final balance report is prepared. This report shall include any problems encountered during balancing or major deviations from specified conditions.
  - G. If required, a meeting shall be arranged between the Architect, the Contractor, the Balance Contractor and the Engineer to resolve any problems or deviations from the Contract Drawings and Specifications before the final balance work is completed and final report is submitted for review by the Engineer.
- 3.2 All dampers, and damper operators shall be checked and adjusted for proper operation and travel.
- 3.3 The Contractor shall adjust all equipment in the mechanical system to obtain proper operation and shall demonstrate to Macy's, Commissioning Agent, Engineer and the Architect that the entire system will function properly.

END OF SECTION 23 05 93

SECTION 23 05 94 - PROTECTION AND CLEANING

PART 1 GENERAL

1.1 REFERENCE

- A. Drawings and general provisions of the Contract, including General and Supplementary conditions and Divisions 01 Specifications Sections, apply to this Section.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

- 3.1 Protect all mechanical equipment against damage from any cause whatsoever and pay the cost of replacing and repairing equipment made necessary by failure to provide suitable protection.
- 3.2 After all equipment and ductwork has been approved and after all plastering has been completed, bare piping and insulation provided under this Contract shall be thoroughly cleaned of dirt, grease, rust and oil.
- 3.3 Repair all dents and scratches in factory prime or finish coats on all mechanical equipment to the satisfaction of the Architect. If damage is excessive, replacement may be required.
- 3.4 Ductwork and air handling equipment is to be cleaned out and blown out.
- 3.5 Cover all motors, fans, ductwork etc., to keep out dirt, water and weather during construction.
- 3.6 This Contractor shall clean up and remove all debris from the site and shall at all times keep the premises in a neat and orderly condition.
- 3.7 In addition to the provisions and stipulation of the General Conditions, this Contractor shall provide various types of protection as follows:
  - A. Protect equipment and finished surfaces from paint droppings, insulation adhesive and sizing droppings, etc., by use of drop cloths.
- 3.8 All equipment shall be stored at the site with openings, bearings, etc., covered to exclude dust and moisture. All stock piled pipe and duct shall be placed on dunnage and protected from weather and from entry of foreign material.
- 3.9 Conduit and construction openings and excavations required for HVAC work shall be covered when work is not in progress, as follows:
  - 1. Cover all open ducts both before, after installation to prevent entry of duct and dirt.
- 3.10 Macy's property and the property of other Contractors shall be scrupulously respected at all times (including damage from leaks). Provide drop cloths and visqueen or similar barriers where dust and debris is generated, to protect adjacent areas.
- 3.11 This Contractor shall be held responsible for damage caused by his work or through neglect of his workmen. Repairing of damaged work shall be done by this Contractor as directed by the Architect . Cost of repairs shall be paid by this Contractor.

- 3.12 Macy's and Architect reserve the right to make emergency repairs as required to keep equipment in operation without voiding the this Contractor's guarantee bond not relieving the this Contractor of his responsibilities during the bonding period.
- 3.13 Exercise care in cleaning and lubrication of bearings after equipment has been subjected to prolonged periods of storage before operating. This Contractor shall be responsible for continued lubrication of equipment until acceptance of this work.

END OF SECTION 23 05 94

SECTION 23 05 96 - SUBSTITUTIONS

PART 1 GENERAL

1.1 REFERENCE

- A. Drawings and general provisions of the Contract, including General and Supplementary conditions and Divisions 01 Specifications Sections, apply to this Section.

1.2 SCOPE

- A. The Base Bid shall be based on equipment as specified. Where items are mentioned thusly, "may be furnished at the Contractor's option", this Contractor may use any one of the items named for his Base Bid. Proposals for substitutions are welcomed, but must be noted separately from the Base Bid and applied for in writing at Bid submittal.
- B. Where the Contractor furnishes equipment or material specified as equal, he is responsible for all modifications required for his work, and work of all other trades to install the equipment and ensure performance as originally specified.
- C. Equipment and materials furnished as equal or as a substitution must be equal in quality, design, features, performances, arrangement, and appearance to that specified as standard.

- 1.3 Read Instructions to Bidders and General and Special Conditions for requirements for substitutions.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

END OF SECTION 23 05 96



SECTION 23 31 13.13 - LOW PRESSURE DUCTWORK

PART 1 GENERAL

1.1 REFERENCE

- A. Drawings and general provisions of the Contract, including General and Supplementary conditions and Divisions 01 Specifications Sections, apply to this Section.
- C. Section 23 33 13 – DAMPERS
- D. Section 23 37 13 - REGISTERS, GRILLES AND DIFFUSERS

1.2 SCOPE

- A. Furnish, install and insulate low pressure sheet metal work and appurtenances with sizes as shown on Drawings.
- B. All sheet metal work including ductwork, dampers, etc., shall be fabricated in accordance with the recommendations of the Sheet Metal and Air Conditioning Contractor's National Association, Inc., (SMACNA) latest edition of the FOLLOWING:
  - 1. HVAC DUCT CONSTRUCTION STANDARDS, Metal and Flexible.
- C. The Contractor is to provide 3 dimensional (3D) coordination model sheet metal drawings for use in coordinating work of Plumbing, Fire Protection and Electrical with layout of air distributions system and related work per 23 01 10, paragraph 1.02 E.
- D. The use of duct liner is only permitted for use in transfer ducts, and exhaust fan discharge.
  - 1. Line all transfer ducts and ducts on discharge of exhaust fan
  - 2. Line all ducts cross hatched on the drawings.

PART 2 PRODUCTS

2.1 Sheet Metal Ductwork:

- A. Unless otherwise noted, all sheet metal ducts and plenums shall be fabricated of lock forming quality, hot-dipped galvanized steel sheets and shall comply with 2" w.g. pressure class construction. Metal gauges shall be in accordance with current SMACNA Standards.
- B. Flexible duct shall comply with NFPA requirements, Pamphlet 90A, and shall be UL listed with flame spread rating of 25 or less and smoke developed rating of 50 or less. Duct shall be a factory fabricated assembly composed of: an inner duct of woven and coated fiber glass providing an air seal and bonded permanently to corrosion resistant coated steel wire helix and 1" thick fiber glass insulating blanket and low permeability outer vapor barrier of fiber glass reinforced metalized film laminate.

Flexible duct shall be terminal duct for air system and shall not exceed 5 feet in length. Do not make more than one (1) 90 degree bend with flexible duct. Bend radius shall be minimum of two (2) times duct diameter.

- 1. Flexible duct shall be Thermaflex MKC.
- 2. Duct shall be rated for minimum 10" W.G. internal working pressure, for all duct sizes.

3. Vinyl, clear plastic or mylar type liners are expressly prohibited.
  4. Flexmaster Type 3M insulated or Wiremold WCK flexible duct meeting all specified requirements may be furnished at the Contractor's option.
- C. All fan flexible connections shall be made with commercial grade neoprene coated glass fabric (heavy duty).
  - D. All duct sealing compounds and mastics shall meet NFPA 90A standards and shall be UL listed with ratings not to exceed 25 for flame spread and 50 for smoke development.
  - E. Sealer for ducts shall be equal to 3M Model EC-800. (Water Based Low VOC).

## 2.2 DUCT LINER

- A. Duct liner shall be 1" thick, 1½ pound density flexible thermal and acoustical insulation manufactured of textile-type glass fibers bonded with a thermosetting resin and microbial properties. Insulation shall be faced with a fire retardant black coating. Liner shall conform to the requirements for flexible duct liner material as outlined in the SMACNA "HVAC Duct Construction Standards".
- B. Adhesive shall be fire retardant, and formulated for duct liner application service. Adhesive shall conform to the requirements for classification Type 1, as outlined in the SMACNA "HVAC Duct Construction Standard".
- C. Liner and adhesives shall have flame spread classification of less than 25, and smoke developed ratings of less than 50.

## PART 3 EXECUTION

### 3.1 SHEET METAL DUCTS

- A. Except as noted or shown otherwise on the Drawings, all sheet metal work including ductwork, dampers, etc., shall be fabricated and supported in accordance with the recommendations of the SMACNA "HVAC Duct Construction Standards".
- B. Cross break all flat surfaces or reinforce with a bead approximately 5/16" wide x 3/16" deep on 12" centers, to prevent vibration on all ducts 19" maximum dimension and larger.
- C. Sheet metal plenums shall be single wall construction, reinforced with steel angles 2 ft. on center. Provide hinged access doors where shown on the Drawings. Provide close off sheet metal as required. Provide neoprene sponge gaskets between filter frames and housing for mixed air plenums. Gauges same as specified for ducts, unless otherwise noted. At the Contractor's option, sheet metal ducts and plenums may be put together using "K-Lock", "Ductmate" or "TDC Lockformer" couplings.

### 3.2 FLEXIBLE AND ROUND DUCT CONNECTIONS

- A. Connection of flexible and round ducts to rectangular ducts to be made with spin-in type fittings complete with damper with locking operator.

### 3.3 LINED DUCTWORK - TRANSFER DUCTS AND AT ROOFTOP HVAC UNITS

- A. Adhere liner to all interior surfaces of ducts with fire-retardant adhesive. Use mechanical fastenings (maximum 16" on centers) on all rectangular ducts - maximum 18" dimension and larger. Duct dimensions refer to inside opening after 1" thick liner material is applied.
- B. Seal all leading edges of liner, including at duct joint, coils and dampers, with a thick coat of fire-retardant adhesive to prevent erosion.
- C. Liner installation shall comply with the recommendations of the SMACNA "HVAC Duct Construction Standard".

3.4 FITTINGS AND ACCESSORIES

- A. Install flexible connections in all duct connections to fans unless otherwise noted.
  - B. Install manual balancing dampers with locking quadrants where shown on the Drawings and as required for proper balancing of the systems. Locking quadrants shall be easily accessible. On insulated ducts, locking quadrants shall be installed on outside of insulation.
  - C. Install double turning vanes in all right angle elbows. Install 45° tap collar for branch ducts and register openings.
  - D. All duct joints in supply, return and exhaust duct systems shall be made sealed with duct sealer.
  - E. All dampers, shall be provided by this Contactor.
  - F. All round ductwork and fittings shall be spiral lockseam construction equivalent to United Sheet Metal. The use of Snap-Lock ductwork is prohibited.
  - G. The use of multi-piece adjustable angles and elbows is prohibited.
- 3.5 Exposed duct sealer is not acceptable on exposed ductwork. Ductwork shall be sealed on the inside or gasket ductwork shall be used.
- 3.6 All ductwork supported by Truss/Bar Joist shall be supported from the top chord only.

END OF SECTION 23 31 13.13

## SECTION 23 33 13 – DAMPERS

### PART 1 GENERAL

#### 1.1 REFERENCE

- A. Drawings and general provisions of the Contract, including General and Supplementary conditions and Divisions 01 Specifications Sections, apply to this Section.
- B. Section 23 31 13.13 - LOW PRESSURE DUCTWORK

#### 1.2 SCOPE

- A. Furnish and install dampers and appurtenances with size and capacities as shown on Drawings.

### PART 2 PRODUCTS

#### 2.1 MANUAL BALANCING DAMPERS

- A. Based on Ruskin Type MD-35/0B opposed blade with molded synthetic bearings, 6" wide 16 gauge galvanized steel blades, extended shaft and linkage.
    - 1. Balance dampers for round ducts shall be Ruskin MDRS- 25 single blade, 20 gauge galvanized steel.
    - 2. All dampers shall be equipped with locking quadrants.
  - B. At the Contractor's option, manual balancing dampers shall be manufactured by the Contractor per SMACNA Standards. Dampers shall have locking quadrants on both sides of the duct.
- 2.2 Dampers by Ruskin, Air Balance, Arrow, American Warming and Ventilating, or Vent Products of the same type and meeting specified requirements, may be furnished at the Contractor's option.

### PART 3 EXECUTION

- 3.1 Install dampers as recommended by manufacturer.
- 3.2 Inspect areas to receive dampers. Notify the Architect of conditions that would adversely affect the installation or subsequent utilization of the dampers. Do not proceed with installation until unsatisfactory conditions are corrected.
- 3.3 Install dampers at locations indicated on the drawings and in accordance with manufacturer's UL approved installation instructions.
- 3.4 Install dampers square and free from racking with blades running horizontally.
- 3.5 Do not compress or stretch damper frame into duct or opening.
- 3.6 Handle damper using sleeve or frame. Do not lift damper using blades, actuator, or jackshaft.
- 3.7 Install bracing for multiple section assemblies to support assembly weight and to hold against system pressure. Install bracing as needed.
- 3.8 All dampers and damper operators shall be checked and adjusted for proper operation and travel.

3.9 All dampers shall be labeled per International Building Code requirements.

3.10 Install dampers as recommended by manufacturer.

END OF SECTION 23 33 13

SECTION 23 37 13 - REGISTERS, GRILLES AND DIFFUSERS

PART 1 GENERAL

1.1 REFERENCE

- A. Section 23 31 13.13 - LOW PRESSURE DUCTWORK

1.2 SCOPE

- A. Furnish and install registers, grilles, diffusers and appurtenances.

PART 2 PRODUCTS

2.1 SQUARE CEILING SUPPLY AIR DIFFUSERS (TYPE A)

- A. Adjustable air pattern steel square ceiling diffusers with round neck. Air pattern to be adjustable from full horizontal to full vertical.
  - 1. Titus TMSA, steel adjustable to fit into lay-in ceiling grid.
  - 2. Provide with equalizing grid (EG).

2.2 RETURN AIR GRILLES (TYPE B)

- A. Grilles with curved horizontal face bars, fixed at 45 degrees
  - 1. Titus 350RL, steel, lay-in.

- 2.3 Registers, grilles and diffusers by Price or Krueger of the same type, size and meeting other specified requirements may be furnished at the Contractor's option.

PART 3 EXECUTION

- 3.1 All steel grilles shall be furnished with factory prime coat of paint. Outlets in ceilings shall be furnished with factory white finish unless otherwise noted.
- 3.2 Diffusers in ceilings shall have flush appearance and shall initially be set by the Contractor for horizontal air pattern distribution.
- 3.3 Manufacturer's drawings shall include the "K" factor for use with an Alnor Velometer for each size and type of register, grille and diffuser furnished.
- 3.4 Furnish frames and trim compatible with existing ceilings.
- 3.5 All diffusers shall be installed with equalizing grid.
- 3.6 Provide additional support hangers for diffusers, grilles and registers mounted in lay-in ceiling tiles.

END OF SECTION 23 37 13

SECTION 26 00 00 - ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

A. GENERAL

1. These specifications include all labor, materials, equipment and related items required to complete work within the intent of the drawings and specifications, whether or not specifically mentioned. For this reason, the Contractor shall visit the site before submitting his bid and familiarize himself with the areas in which work is to be done.
2. Set all sleeves and cut and patch all miscellaneous holes necessary for the convenient and proper installation of the work according to Sections 260012. Required holes through existing masonry construction with an area less than 35 square inches shall be considered miscellaneous holes.
3. Any work installed without regard to the work of other crafts which must, in the opinion of the Architect/Engineer, be moved to permit the installation of other work, shall be moved and replaced as a part of this work without extra charge.
4. Rough-in for and connect, as shown on the drawings, facilities for equipment furnished by the Owner under a separate contract.
5. All work shall be furnished and installed in complete accordance with the edition of NFPA 70 that has been adopted by the authority having jurisdiction.
6. All work shall be furnished and installed in complete accordance with seismic requirements of the building Code that has been adopted by the authority having jurisdiction.

B. RELATED DOCUMENTS

1. All drawings and applicable provisions of Division 0 Bidding Requirements and Division 1 General Requirements apply to work of this Section.

C. RULES AND REGULATIONS

1. The rules, regulations, ordinances of all applicable governing bodies in force at the time of execution of the Contract shall become a part of these specifications. These shall include the requirements of state, county, city and also the local utility companies.
2. All materials furnished and work performed shall be in compliance with the latest applicable version of the following codes, with any Amendments by the Local Authority Having Jurisdiction

International Building Code  
International Existing Building Code  
International Fire Code  
International Energy Code  
International Mechanical Code  
International Plumbing Code  
National Electrical Code

D. PERMITS AND FEES

1. Cost of all fees, permits or licenses that may be required for the performance of the Contract shall be included.

#### E. PLANS AND SPECIFICATIONS

1. The specifications and the accompanying drawings (architectural, structural, mechanical, EMS, electrical, fire protection and plumbing) are mutually explanatory and anything described or shown on one, but not on the other, shall be considered as if shown or described on all. The intention of the drawings and specifications is to provide complete functioning systems in every respect. Furnish all material and equipment and perform all labor to achieve this intent, whether or not such material or equipment is indicated herein. Whenever the term "provide" is used, it shall mean "furnish and install."
2. Data given herein and on the drawings is as exact as could be secured. Their absolute accuracy is not guaranteed and this Contractor shall obtain and verify exact locations, measurements, levels, space requirements, etc., at the site, and shall satisfactorily adapt the work to actual conditions at the building as constructed.
3. The drawings shall be considered schematic and are not intended to indicate all changes in direction and necessary fittings to be installed by this Contractor. Conduit, equipment, etc., shall be installed so all items clear the structure and other building elements and maintain appropriate clearances for access, service and maintenance.
4. All plans and specifications including architectural, structural, electrical, EMS, plumbing and HVAC plans shall be examined by Contractor prior to submission of quotations to determine systems interface and conditions which could cause interference or deviations in equipment locations and routing.
5. Routing of conduit and location of equipment and other devices are shown on plans for general guidance. This Contractor shall coordinate his work with other Contractors and shall provide necessary deviations in routing as far as 10 feet from those shown to provide systems as specified or implied, without interference and pursuant to these requirements at no additional cost to the Owner, Architect or Engineer.
6. Contractor shall not scale the drawings. Refer to architectural and structural drawings for building construction and dimensions and to room finish schedule on architectural drawings for material, finish and construction method of walls, floors and ceilings in order to insure proper rough-in and installation of contractor's work.
7. Manufacturer's drawings and instructions shall be followed in all cases where the makers of devices and equipment furnish directions covering points not shown on the drawings or described in the specifications.
8. Layout and installation of electrical work shall be coordinated with the overall construction schedule of various trades to prevent delay in completion of the project. Complete drawings and specifications for the entire job shall be available at the job site.
9. Changes, modifications or variations to the plans and specifications will be issued by the Engineer in writing.

#### F. DISCREPANCIES OR OMISSIONS

1. During the bidding period, any discrepancies or omissions in any of the documents or any doubt as to their meaning, should be reported to the Engineer who will, time permitting, issue a written instruction in the form of an addendum to all bidders of record. The Engineer will not be responsible for any oral explanations or interpretations of the documents.
2. During construction, should a discrepancy or omission be found, it shall be brought to the attention of the Engineer at once for resolution.



3. No changes in contract price will be allowed for minor changes in layout or location required to avoid interferences, obstructions, etc. Contract price changes will be considered only for changes in the scope of the project requirements. All such scope changes and price revisions must be authorized in writing.
4. If discrepancies are found within the contract documents, the most demanding requirement shall take precedence unless otherwise agreed by the engineer in writing.

G. VISIT TO SITE

1. Prior to submitting his quotation for work under this project, this Contractor shall visit the site to examine all conditions related to his work, and to acquaint himself with the conditions under which the work will be performed.
2. Failure to fully acquaint himself with existing site conditions under which the work is to be performed will not be justification for additional compensation after the award of the contract. See General Conditions for additional requirements.

H. HOISTING

1. This Contractor shall be responsible for hoisting of all materials and equipment furnished or installed under this Section of the Specifications, in accordance with all city, state and federal rules and regulations.

I. SHOP DRAWINGS AND MATERIAL LIST

1. This Contractor shall submit within 10 days from the date of the contract, a complete list of all material and equipment he proposes to use in the installation. This list shall include manufacturer, catalog numbers and other identifying information. SHOP DRAWINGS WILL NOT BE REVIEWED UNTIL THIS LIST HAS BEEN SUBMITTED AND REVIEWED. After review of this list by the Engineer, the Contractor shall submit shop drawings and descriptive literature of equipment to be furnished under this contract. Drawings shall state capacities, sizes, etc., of all equipment and shall be certified. See General Conditions and Supplementary Conditions for additional requirements.
2. The Contractor shall submit four (4) copies of all required Shop Drawings and material and equipment lists for the Engineer and Owner's sole use. The Contractor shall submit additional copies that will be required for his own use. The additional copies will be reviewed by the Engineer and returned to the Contractor marked accordingly.
3. Each shop drawing, catalog cut and/or specification sheet shall be marked with the name and location of the project. The shop drawings shall be reviewed by the Contractor, stamped and signed certifying that he has found them to be 100% complete and accurate, prior to submission. Failure to stamp shop drawings in this way will be grounds for rejection of shop drawing.
4. All drawings shall be submitted in a suitable binder with sheets permanently attached. Each item shall be clearly identified as to type, size, etc. The binder shall be labeled with job name, location, Architect, Engineer, Contractor, and the date. No review will be given unless submitted as specified. In the event of acceptance of substitutions, it will be for arrangement or design only, and this Contractor shall be responsible for the accuracy of dimensions, operations, etc.
5. Shop drawings review is for purpose of determining only that equipment submitted conforms with design intents. Contractor shall be responsible for deviations, errors and omissions in submittals, and this responsibility shall not be relieved by Engineers' review of submittals.

6. The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Engineer's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Engineer in writing of such deviation at the time of submittal and (1) the Engineer has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Engineer's approval thereof.
7. The Contractor shall submit shop drawings on equipment and systems required by this specification and on the following equipment and systems, when furnished by him, as a minimum (but shall not necessarily be limited to these items, and may be asked for additional items at the discretion of the Engineer).

#### ELECTRICAL

Safety Switches (If Applicable)  
Panelboards (If Applicable)  
Transformers (If Applicable)  
Light Fixtures, Lamps and Ballasts (Furnished by EC and Installed by the EC)  
Fire Alarm System  
Wiring Devices  
Raceway & Fittings  
Motor Control

#### J. RELEASE OF CADD FILES

1. See "Release of Cadd Files Form" at the end of this section.

#### K. OPERATION AND MAINTENANCE MANUALS AND INSTRUCTIONS

1. Prior to final payment, four (4) sets of operation and maintenance manuals shall be provided to the Architect/Engineer for submittal to the Owner.
2. Each major piece of equipment shall be included in these manuals with operating procedures, routine maintenance recommendations, parts lists, wiring diagrams, piping diagrams, etc. These manuals shall include all equipment including Owner Furnished items.
3. At a predetermined time, prior to the store opening, an instructional session shall take place. The installing contractors and major suppliers shall instruct the Owner's operating personnel on operation and maintenance of the systems. The installing Contractor shall submit documentation indicating the date of instruction; names and organization of persons providing and receiving the instructions; systems the instructions covered; and materials received.

#### L. RECORD DRAWINGS

1. During construction, a separate set of plans at the jobsite shall be maintained by the Contractor to keep a record of all changes of locations. See General Conditions and Supplementary Conditions for additional requirements.
2. Locations of conduit, junction boxes and other concealed facilities are to be shown by the Contractor if and when they differ from the drawings.
3. "As built" drawings are to be submitted to Architect/Engineer for review prior to the time of request for final payment. Submit as-built record drawings in accordance with the General Conditions.

M. WORKMANSHIP AND MATERIALS

1. All work shall be performed in a manner acceptable to the Engineer, Architect, and the Owner, by properly trained, supervised and experienced personnel using new and clean materials, supplies, equipment, and hardware.

N. MATERIAL AND EQUIPMENT HANDLING AND STORAGE

1. Space at the project for storage of materials and products is limited. Coordinate the deliveries of electrical materials and products with the scheduling and sequencing of the work so that storage requirements at the project are minimized. In general, do not deliver individual items of equipment to the project substantially ahead of the time of installation.

O. GUARANTEE AND WARRANTY

1. This Contractor shall guarantee and warrant all equipment, materials, workmanship, installation, etc., for a period of one year in accordance with the General Conditions.
2. During the guarantee period, this Contractor shall make all required repairs and replacements, and shall provide all necessary service, labor, tools, materials, parts, etc., required during this period at no additional cost to the Owner.

PART 2 - PRODUCTS

A. MATERIAL SUBSTITUTION

1. First named manufacturer in the specifications has been used in the preparation of the drawings to determine quality standard, space requirements, etc. First named manufacturer shall be used in the base bid. Other named manufacturers may be used for the base bid in lieu of first name, but Contractor shall be responsible for all changes required due to the substitution. These changes could include, but not be limited to, the following: Space requirements, electrical characteristics, weight, location of connections, pipe stress, etc. Added costs relating to the substitution of additional named manufacturer shall be the responsibility of the Contractor.
2. If the Contractor wishes to submit an alternate to the named manufacturers for any equipment, he may submit a voluntary alternative with his bid, stating the manufacturer's name, model number, and the amount to be added to or subtracted from his base bid. In all cases, if the alternate manufacturer is used, this Contractor shall bear all additional costs including, but not limited to, responsibility of coordination with all other trades, any changes incurred in plumbing, electrical, mechanical, general contracts, etc., which result from equipment substitution.

B. CAULKING AND SEALANT

1. Furnish and install caulking and sealant for all conduit and duct passing through floor structural slabs, plaster ceilings and all partition walls. This shall apply to all, whether concealed in chases, above dropped ceiling areas, or exposed.
  - a. Packing:
    - (1) Non Fire Rated Walls: Conduits passing through non-rated walls shall be sealed both sides of the openings. They shall be caulked with a resilient non-hardening acoustical caulking material such as U.S.G. Acoustical Sealant, Tremco or equal.
    - (2) Fire Rated Walls: All material and installation shall comply with UL listed Fire Systems, equivalent to the fire rated walls, ceilings and floors. A pure ceramic fiber made of alumina-

silica "Cerablanket FS" by Manville for Tremco.

- b. Sealant: All material and installation shall comply with UL listed Fire Systems, equivalent to the fire rated walls, ceilings and floors. An acrylic 2-part gun applied, fire resistive sealant, "Dymeric" by Tremco or equal.
- c. Provide pre-assembled fire rated 3"X3"X10" sleeves "EZ Path" by Specified Technologies for low voltage cables (fire alarm, telephone, data, etc).
2. Limit the size of the space between the wall, floor or floor and the outside of the conduit or ducts to 1" maximum. This space is sufficient to allow some movement of the pipes or duct without cracking the caulking or sealant.
3. For openings in walls, the caulking shall be applied to a minimum of 3" total depth. Sealant shall then be applied on both sides of the wall opening a minimum of 1/2" in depth, finishing flush with the wall.
4. For openings in floors or roofs, the caulking shall be applied from the upper side to a minimum of 3" total depth recessed 1/2" below the finished floor or roof. This 1/2" recess shall then be filled with sealant to flush with finished floor or roof.

### PART 3 - EXECUTION

#### A. GENERAL

1. Contractor shall furnish all material, equipment, labor, services, supplies, etc., required to execute to completion all work shown on the mechanical, electrical, and plumbing drawings, described in these specifications, or made necessary by the work shown on the drawings and/or described in these specifications.
2. This Contractor shall schedule all work and furnish the required materials in such a manner that the work may progress from start to finish in an expeditious and efficient manner without undue interruption. This Contractor shall also schedule his work to coordinate with the construction staging for this project.
3. Contractor shall hire the proper trades to accomplish the work described on the drawings or in the specifications.

#### B. COORDINATION OF TRADES

1. Prior to the fabrication or installation of any materials, this Contractor shall review the drawings indicating work to be performed by each trade. If conflicts occur, they shall be brought to the attention of the Engineer for resolution.
2. If this Contractor installs the work without coordinating with the other trades, then, if requested by the Owner, Architect, or Engineer, this Contractor shall remove and rework some installed work to resolve a conflict, and such change shall be done at no change in contract price.
3. The Contractor supplying the equipment shall furnish all motors and components which are part of the equipment.
4. Control wiring is defined as that wiring which conducts electrical energy at a voltage of less than 100 volts. Interlock wiring is defined as that wiring which performs a control function, but at a voltage of 100 volts or greater. All other wiring shall be considered power wiring.

5. Electrical Work for Mechanical Equipment

a. Electrical Contractor shall wire all mechanical equipment furnished by various contractors in accordance with the following general provisions:

- (1) Power wiring from panel to motor controllers, relays, etc., and from controller to motor terminals per equipment manufacturer's wiring diagram.
- (2) Furnish, install and wire heavy duty, quick-make, quick-break type, disconnect switches indicated on drawings or required by Code. Refer to schedules on mechanical drawings for responsibility of furnishing disconnects.
- (3) Unless noted otherwise, the Electrical Contractor shall furnish and install all starters, disconnects, switches, etc., except those which are furnished with the equipment as a part of a factory-assembled package.

6. See Sections 016439, 210000, 220000, and 230000 for additional information on EC responsibility.

C. PROTECTION OF EQUIPMENT AND WORK

1. This Contractor shall, at all times, protect and preserve all materials, supplies, equipment, piping, etc., from damage due to weather, corrosion, dirt, vandalism, theft, etc., and shall further provide all enclosures or special protection as indicated by circumstances.
2. Should any of the materials, equipment, etc., be damaged as a result of his negligence, then this Contractor shall be held responsible for all such damage and costs incurred for repair or replacement.

D. CONSTRUCTION STAGING

1. See schedule in Division 0 and Division 1. This Contractor shall cooperate with and coordinate with the Owner's Representative to plan and schedule the work to satisfy the schedule.
2. All work shall be so arranged that electrical power, sewer, water, and other services are available to the building at all times, except for short periods of interruption necessary for the performance of new work. Interruptions shall not be requested until the new services are complete and ready for final connection.
3. All interruptions shall be scheduled, and services shall not be interrupted without written approval of the Owner's Representative. Notification to the Owner's Representative shall include the exact time and estimated duration of any interruption.

E. EQUIPMENT FURNISHED BY OTHERS

1. Some pieces of equipment, as indicated in the "Equipment Schedule", will be furnished by the Owner and/or under other Divisions of these specifications. This Contractor shall refer to the "Equipment Schedule" and perform the responsibilities assigned to him.
2. Start-up of equipment furnished by the Owner or under other Divisions of these specifications shall be the responsibility of this Contractor under the Section assigned the responsibility to receive and set in place or to move and set in place.
3. Warranties for equipment furnished shall be by the equipment manufacturer.

F. MAINTENANCE OF WORK AREAS

1. During the project, this Contractor shall maintain his work area in an organized manner, shall not allow

debris to accumulate, and shall store equipment, tools and supplies in a manner which shall not cause interference with the activities of others engaged on the project.

2. Open ends of conduit, equipment and specialties shall be kept properly closed during construction and installation so as to avoid contamination.

G. CLEANING AND CLEANUP

1. Upon completion of this work, the Contractor shall clean all conduit and devices. Contractor shall leave all work in a finished, clean, and satisfactory working condition.
2. Each contractor shall be responsible for his own cleanup. Contractor shall periodically remove all rubbish, crating, unused material, outfall, and any other debris created by him during the course of the work as directed by the Owner.
3. Plated surfaces shall be polished. Lighting fixtures and lamps shall be wiped clean with all dust, dirt and finger prints removed.

END OF SECTION 26 00 00

RELEASE OF CADD FILES

The drawings prepared by Prater Engineering Associates have been prepared using AUTOCAD 2017. Files for plan drawings prepared by Prater Engineering Associates will be made available to the successful HVAC, plumbing, electrical and automatic sprinkler contractor if requested either in the form of a diskette or by email; no other drawings will be released. The files will have background files bound in, borders and title blocks removed, and all notes, details, diagrams, and schedules removed. A release form must be signed. Utilization of these documents for the development of shop drawings and submittals does not relieve the contractor from any of his responsibilities herein.

Release form that must be signed:

As requested, Prater Engineering Associates will provide (name of contractor) with electronic CADD files of the requested (M, E, P, FP) floor or ceiling plans on the terms set forth below. While SSC is not required under its contract to provide or update these electronic files for this purpose, they are being made available as a convenience to the contractor and as a substantial time saver in the preparation of submittals for this project.

The files contain information through the date when the drawings were issued for bidding and may or may not contain information from the addenda. The company using these files shall be responsible for the coordination of the information contained therein with the Plans, Specifications and other Contract Documents. In the event of any ambiguity, discrepancy or conflict between the information within the electronic files and the Contract Documents, the Contract Documents shall be used.

SSC will not be responsible for any error or malfunction in the translation, interpretation or use of this electronic information once it has been provided to the contractor. SSC does not assume any responsibility arising out of the use or adaptation of the information contained in these files or the sufficiency of any drawings prepared based upon the information included within. By accepting these drawing files, the contractor agrees to hold the Engineer harmless with regard to any errors or omissions in the drawing files. Nothing included in this release shall modify any requirements or responsibilities of either party under their respective contracts.

Signing below indicates understanding and acceptance of these terms. Upon receipt of a signed letter or fax, SSC will release the electronic CADD files.

Specific Drawings Request: \_\_\_\_\_

Acknowledged and Agreed:

Company \_\_\_\_\_ Version of AutoCAD used \_\_\_\_\_

Name (Must be an officer of the Company) \_\_\_\_\_ E-mail address \_\_\_\_\_

Title \_\_\_\_\_ Maximum e-mail attachment size \_\_\_\_\_

Date \_\_\_\_\_

## SECTION 26 00 11 - SCOPE OF ELECTRICAL WORK

### PART 1 - GENERAL

#### A. GENERAL

1. Work under the electrical contract shall include furnishing of all materials, accessories, tools, equipment, transportation and labor required to completely execute the electrical work as described in the specification, and/or shown on the contract drawings unless specifically noted otherwise.
2. Contractors shall refer to architectural and structural plans for building construction and dimensions. Refer to architectural room finish schedules for materials and finish of walls, floors, and ceilings so proper rough-in may be provided. Do not scale drawings.
3. The electrical drawings are diagrammatic. When locations and elevations of electrical work are critical, the dimensions will be noted on the interior designer's Power and Signal drawings or the dimensional lighting drawings. Where directed by the Architect/Engineer/Owner, or where field conditions necessitate the offset of any electrical work, the contractor shall locate any equipment or devices to a point within a radius of 10 feet from the general location on the plans. This will be done at no extra cost if the contractor is not required to redo work already begun.
4. For the purposes of this project, the following definitions will apply:

Electrical Contractor - Owner's electrical contractor responsible for store fixturing electrical work and store building electrical work.

#### B. RELATED DOCUMENTS

1. All drawings and applicable provisions of Division 0 Bidding Requirements and Division 1 General Requirements apply to work of this Section.
2. Section 260000 - Electrical General Provisions.

### PART 2 - DESCRIPTION

#### A. SCOPE OF WORK

1. Work under the electrical contract shall include, but is not limited to the following:
  - a. Power and Lighting Distribution System
  - b. Power and Lighting Branch Circuit Panelboards installation
  - c. Lighting and Emergency Lighting Systems
  - d. Power and Lighting Branch Circuits
  - e. POS Rough-in Conduit System
  - f. Fire Alarm System Complete with Cable and Terminations
  - g. Connection of equipment furnished by others
  - h. Miscellaneous Work As Shown On The Drawings And As Called For In The Specifications
  - i. A Complete Ground System As Required Or Noted On The Drawings
  - j. Final Connections To All Electric Powered Equipment (Unless Otherwise Specified)
  - k. Demonstration of Systems
  - l. Testing
  - m. Coordination
  - n. Sawcuts in Floors For Floorboxes and Core Drills for Conduit Risers Between Floors
  - o. Instructions To Operating Personnel
  - p. Temporary Light And Power
  - q. Cutting And Patching



2. The description of the various portions of the work shall be as indicated on the in the specifications and the Electrical Drawings. As a clarification, the Electrical Contractor's Work shall include, but not be limited to, the following:
  - a. Wiring from junction boxes and outlets.
  - b. All electrical work on high walls (walls to or through ceiling) shall be "fed-down" from junction boxes in the ceiling space above.
  - c. Installation, connection and interconnection of all fitting room and lighting fixtures.
  - d. Installation of all lamps, furnished by the Owner in fitting rooms, valance and other wall light fixtures and other illuminated fixtures.
  - e. Provide all duplex and other receptacles on store walls, partitions and freestanding fixtures including wiring to the nearest ceiling junction box or floor outlet.
  - f. Provide all wiring beyond basic building outlets and make all required connections and interconnections (unless noted otherwise on the Electrical Drawings) to prewired furniture/counter systems, center islands, lighted loose fixtures of any nature, lighted wall fixtures, shelf lighting, etc. - including wiring to the nearest ceiling space service fitting. Details of work required at selected areas is detailed on drawings at the end of this specification.

#### PART 3 - EXECUTION

- A. The EC shall include all costs, labor, and material for a complete operational electrical system, as described by the drawings, specifications and scope of work.
- B. The EC should note that the space above the ceiling is a return air plenum and should include all costs necessary to comply with the code.

END OF SECTION 26 00 11

SECTION 26 00 12 - BASIC ELECTRICAL MATERIAL AND METHODS

PART 1 - GENERAL

A. SUMMARY

1. Section Includes:
  - a. Sleeves for raceways and cables.
  - b. Cutting and patching.
  - c. Painting
    - (1) In general, painting is to be provided by the Painting Contractor. All touch-up painting shall be provided by the EC.
  - d. Equipment and conduit identification.
  - e. Noise and vibration control.
  - f. Underwriters Laboratory Listing.
  - g. Electrical equipment locations and mounting heights
  - h. Grout.
  - i. Common electrical installation requirements.

B. RELATED DOCUMENTS

1. All drawings and applicable provisions of Division 0 Bidding Requirements and Division 1 General Requirements apply to work of this Section.
2. Section 260000 - Electrical General Provisions.

PART 2 - DESCRIPTION

A. SLEEVES AND OPENINGS

1. EXTERIOR AND FOUNDATION WALLS
  - a. Not Applicable.
2. INTERIOR WALLS AND PARTITIONS
  - a. All conduit through interior masonry walls and partitions shall pass through either schedule 40 black steel, or galvanized steel sleeves. Schedule 40 sleeves must be used when required for masonry walls and structural purposes.
  - b. Openings around conduit, etc., through fire rated walls or floors shall be sealed with fire resistant sealant system. Follow manufacturer's installation instructions to provide a seal fire rating equal to the fire rating of the wall, partition, or floor.

### 3. FLOORS

- a. All conduit through floors shall be provided with schedule 40 pipe steel sleeves, extending 1" above floor except in finished areas. Sleeves in finished areas shall terminate flush with floor, and shall be schedule 40 pipe, steel.

### B. CAULKING AND SEALANT

1. Furnish and install caulking and sealant for all conduit and duct passing through floor structural slabs, plaster ceilings and all partition walls. This shall apply to all, whether concealed in chases, above dropped ceiling areas, or exposed.
  - a. Packing:
    - (1) Non Fire Rated Walls: Conduits passing through non-rated walls shall be sealed both sides of the openings. They shall be caulked with a resilient non-hardening acoustical caulking material such as U.S.G. Acoustical Sealant, Tremco or equal.
    - (2) Fire Rated Walls: All material and installation shall comply with UL listed Fire Systems, equivalent to the fire rated walls, ceilings and floors. A pure ceramic fiber made of alumina-silica "Cerablanket FS" by Manville for Tremco.
  - b. Sealant: All material and installation shall comply with UL listed Fire Systems, equivalent to the fire rated walls, ceilings and floors. An acrylic 2-part gun applied, fire resistive sealant, "Dymeric" by Tremco or equal.
2. Limit the size of the space between the wall, floor or floor and the outside of the conduit or ducts to 1" maximum. This space is sufficient to allow some movement of the pipes or duct without cracking the caulking or sealant.
3. For openings in walls, the caulking shall be applied to a minimum of 3" total depth. Sealant shall then be applied on both sides of the wall opening a minimum of 1/2" in depth, finishing flush with the wall.
4. For openings in floors or roofs, the caulking shall be applied from the upper side to a minimum of 3" total depth recessed 1/2" below the finished floor or roof. This 1/2" recess shall then be filled with sealant to flush with finished floor or roof.

### C. CUTTING

1. All openings for conduit shall be provided by the contractor by means of sleeves or framed openings.
2. The contractor shall be responsible for any cutting required for conduits if sleeves or openings are not properly provided. Under no circumstances shall any structural members, load bearing walls, or footings be cut without first obtaining written permission from the Structural Engineer. All cutting and patching shall be done at the expense of the contractor.
3. Cutting shall be limited to the size necessary for working conditions. When cutting surfaces are difficult or costly to replace, such as marble, glazed tile, wood paneling, etc., the contractor shall consult with the Owner in advance and they shall jointly develop a method of cutting. Cutting of the existing concrete floor for conduit runs will be limited to the electrical layout shown on the drawings. Deviation from this is not permitted. The saw cut depth is limited to 2" maximum. The contractor

shall not cut through the steel decking which is 2½” below the top of the concrete slab. Cutting for the floor boxes is to be limited to the top 2½” of the slab

#### D. PATCHING

1. The repair of the trenching of the concrete slab for the conduit placement is as follows:
  - a. The contractor will apply a concrete bonding agent to the exposed surfaces of the concrete before grout placement using the manufacturer’s recommendations for surface preparation and placement. The bonding agent shall be Sika Armatec 110 or an approved equal to be submitted for review by the structural engineer.
  - b. The contractor will fill the trenched slab with 4000 PSI grout to level the slab. The finish applied to the grout repair at the floor will be a troweled finish (see Section 030010-13).
2. Drywall or plastered surfaces - Patch with filler compound. Painting is the responsibility of the contractor doing the cutting and patching and shall be subcontracted to the Owner's Painting Contractor.
3. Surfaces with finishing materials - Such as tiled, paneled, stone or marble surfaces, patch the opening with cement or plaster to the underside of final finishing material. Final patching is the responsibility of the contractor doing the cutting and patching and shall be subcontracted to the contractors doing the specific finish work.

#### E. FIRE PROOFING ON STRUCTURE:

1. Where fire proofing has been applied to the structure by others and the work of this contractor damages or removes this fire proofing while making attachments to the structure, this contractor shall include cost to repair the fire proofing to its original condition.

#### F. PAINTING

##### 1. WORK INCLUDED

- a. Steel supports which are exposed to public view shall be painted by the Painting Contractor.
- b. All manufacturer's finished products such as panelboards, instrument panels, etc., shall have factory standard finish.
- c. Electrical Contractor shall be required to touch up any minor damages or scratches due to shipment, installation, or exposure to weather. Finishes shall be painted to match factory painting. Remove rust before touch up.

##### 2. WORK NOT INCLUDED

- a. Conduit in mechanical rooms, electrical rooms, and duct shafts will not be painted.
- b. All exposed panels, etc., specified to be finished with prime coat at the factory shall be field painted by the Painting Contractor. EC is not responsible for painting in any finished areas.

## G. ELECTRICAL EQUIPMENT LOCATIONS AND MOUNTING HEIGHTS

### 1. LOCATION OF DEVICES

- a. The location of all new wall switches, receptacles and other devices including raceway and pull boxes for panelboard feeder connections as shown on plans are only approximate. Great care must be exercised to determine the exact location for same during roughing in of the boxes by checking architectural detail drawings, electrical detail drawings, shop drawings and equipment layout shop drawings. All locations shall be approved by Architect prior to installation.
- b. Unless specifically shown to be off-centered, the location of wall mounted lighting fixtures shall, in general, be "centered" above a door, mirror, wall panel, furnishings, etc.
- c. Unless otherwise dimensioned or noted, ceiling or pendant mounted lighting fixtures shall be installed symmetrically with ceiling configuration. For acoustical tiled ceiling, center line of lighting fixtures shall be centered with tile unless noted. Check "reflected ceiling" shop drawing plans for center line of tiles and fixture locations in each room. A dimensioned reflected ceiling is included in the plans. This dimensioned reflected ceiling plan will show the exact dimensional locations of all light fixtures in drywall and other special ceilings.
- d. Lighting fixtures, convenience outlets and telephone outlets may be, at Owner's option, relocated to a point within 10 ft. of the location indicated on the drawings at no cost to Owner, provided the Contractor is advised of this relocation before roughing-in begins.
- e. Because of the special wall coverings in special locations of the sales area, the Electrical Contractor shall consult Owner's representative before rough-in of all wall devices in the sales areas.

### 2. MOUNTING HEIGHTS

- a. Unless otherwise called for on drawings, the center line height of all new wiring devices shall comply with the schedule below.
- b. All boxes shall be carefully plumbed, leveled, and rigidly secured so that subsequent operations of other contractors will not cause misalignment.
- c. Schedule (General Guide)

<u>Device</u>	<u>Mounting</u>
Light Switches	46" above floor.
Receptacles	15" AFF or as detailed on drawings.
Disconnect Sw. (Mech. space)	Nominal 4'-6" above floor and in sight of controller.
Receptacles (Mech. space)	46" above floor or directly below the light switches.



## 2. EQUIPMENT IDENTIFICATION

- a. Panelboard - Nameplate shall designate panel number and voltage. Nameplate shall be mounted on the inside of panel door when the panel is located in finished areas and on the front of door when located in mechanical equipment rooms; typewritten branch circuit connection sheet shall be inserted within the card holder provided by panelboard manufacturers. Branch circuit designations shall be made only after the load balancing of the panelboards has been completed and shall be approved by Owner's representative. In general, designations shall include the location name and load type (e.g., Northwest printers, Northeast Charging Station).
- b. Disconnect Switches and Motor Starters - Nameplates shall describe the equipment to be controlled and power circuit number.
- c. Transformers - Nameplate shall identify the equipment by plan designation, primary and secondary voltages, and KVA rating.
- d. Auxiliary System Equipment - The control cabinets for auxiliary systems, such as fire alarm, etc., shall be identified with nameplate describing the system by designation, power circuit and voltage.
- e. Fusible Switches - In addition to the nameplate, there shall be labeled on the inside of switch door, the fuse size required for equipment served.
- f. Junction and Pull Boxes - Identify the function of the box such as "480 volt," "Charging Station," "Fire Alarm," etc., with nameplates.

## 3. RACEWAY IDENTIFICATION

- a. In general, all exposed feeder conduits, wireways, etc., shall be identified. Branch circuit designations shall be made only after the load balancing of the panelboards has been completed and shall be approved by Owner's representative. In general, designations shall include the location name and load type (e.g., Panel HL-1A, Northeast Charging Station).
- b. The identification labels shall be located at intervals of 50 feet or less and at every point where a conduit or raceway is entering and leaving a room.

## I. NOISE AND VIBRATION CONTROL

1. Electrical equipment such as transformers, emergency generator, switchboards, etc., shall be mounted with noise and vibration control devices as specified under the specific equipment headings.
  - a. Noise and vibration control devices shall be the product of Mason Industries, Consolidated Kinetics, Korfund, or approved equal.

### A. UL REQUIREMENTS:

1. All equipment furnished and installed by EC shall be UL listed and labeled if of the type tested.
2. Manufacturer shall notify the Architect/Engineer if equipment specified herein is not UL listed. Failure to give such notice shall imply that the manufacturer (1) has reviewed his equipment with the local inspecting authority and it is approved for installation without modification, or (2) assumes the responsibility for all costs involved should modifications be required for approval of the inspecting

authority.

3. EC shall furnish a UL listed installation for any system that may require a UL listed installation.

#### 1.1 PART 3 - EXECUTION

A. The Contractor shall include all costs for sleeves and openings required by his work.

1. All sleeves and openings shall be located and provided by the contractor.

B. The Contractor shall include all costs for cutting and patching required by his work.

C. The EC shall include all costs for touch-up painting of all equipment associated with his work.

D. The EC shall include any costs for layout of the location and mounting heights.

E. Identification nameplates and labels shall be provided by the EC for all equipment and raceways installed under his contract. It shall include all equipment, such as motor starters and boxes furnished by HVAC, PC and other contractors.

F. EQUIPMENT

1. Provide noise and vibration controls for equipment.

2. All conduit connections to mechanical equipment shall be made with flexible conduits.

3. All flexible conduit connectors shall be approved for grounding purposes.

4. When the mechanical equipment is resiliently mounted, flexible conduit shall be at least 20 diameters in length. No rigid conduit shall be attached to the mechanical equipment subject to vibration.

G. Openings around conduits, wireways, etc., through walls or floors shall be grouted with cement to prevent noise transmission. Grouting shall be made flush with finished surfaces.

1. Openings around conduits, etc., through fire rated wall or floors shall be sealed with fire resistant sealing system.

H. The EC shall assure the Owner/Engineer that all equipment provided by him is listed and labeled for such use by UL.

END OF SECTION 26 00 12



SECTION 26 00 22 - ELECTRICAL START-UP AND TESTING

PART 1 - GENERAL

A. GENERAL:

1. Prior to the start-up of any electrical equipment and systems, EC shall carefully check manufacturer's instructions for proper start-up procedures. Manufacturer's start-up service shall be included in contractor's bid when such services are recommended by the manufacturers.

B. RELATED DOCUMENTS

1. All drawings and applicable provisions of Division 0 Bidding Requirements and Division 1 General Requirements apply to work of this Section.
2. Section 260000 - Electrical General Provisions.
3. Section 260012 - Basic Electrical Materials and Methods.

C. SUBMITTALS

1. Calibration Reports: Submit proof that all required instrumentation has been calibrated to tolerances specified in the referenced standards, within a period of six months prior to starting the project.
2. Submit test reports indicated. The reports shall certify that the systems have been tested in accordance with the referenced standards; are an accurate representation of how the systems have been installed; and are a true representation of how the systems are operating at the completion of the testing procedures. Follow the procedures and format specified below.

PART 2 - DESCRIPTION

A. POWER SYSTEM:

1. System voltages, phasing and grounding:
  - a. Check service entrance voltages and make all necessary adjustments on transformer taps to compensate for any overvoltage or undervoltage conditions.
  - b. Check grounding conditions and grounding resistance for code compliance.
  - c. Check system for proper phasing and direction of rotation of motors.

B. LOAD BALANCE

1. Balance all single phase loads at the panel board for the connected loads on the circuits with all lighting fixtures operating and all single phase fixed building equipment operating. The total connected load between each leg of the panel shall not vary more than 10%.
2. Balancing shall be made by redistributing the branch circuit connections at the panel board. Such revisions as approved by Space Field Engineer shall be reflected on the mounted branch circuit directory and on the "As Built Drawings" and current for each phase shall be recorded and submitted to the Engineer.
3. Balancing shall be done before turning the system over to the Owner and before the Owner's miscellaneous equipment is connected.

4. INFRARED SCANNING TESTS

- a. Infrared Scanning. Prior to Substantial Completion, with Store open during normal business hours, perform an infrared scan of lugs at panel boards that were modified or added as part of this project.
- b. Use a hand held infrared scanning device designed to measure temperature or detect significant deviations from normal values. Where temperature at panel board lugs exceeds 15 degree C above the ambient temperature in the panel, the cause of the higher temperature shall be determined. Provide documentation of device calibration on Installation Verification Checklist ESYS-IN-4.
- c. Prepare report identifying panels checked and describing results of scanning. Include notation of deficiencies detected, remedial action taken to reduce the temperature deviation over the entire panel to less than 15 degree C, and rescanning observations after remedial action. Submit in accordance with Section 26 00 00.

C. LAMPS

1. Replace all burnt-out lamps located within the area of work on a one-time basis, at the direction of the Owner's Construction Manager, at the completion of work. Lamps shall be furnished by the Owner for fixtures furnished by the Owner; lamps shall be furnished by the EC for fixtures furnished by the EC.

D. ADJUSTMENT AND TESTING

1. Make all adjustments required for auxiliary systems, installed under this contract, i.e., power systems, reinforcement systems, etc., under the direction of each manufacturer's factory Field Supervisor.
2. Operate and test the Electrical System under full load conditions with all mechanical systems in operation.

E. ACCEPTANCE TESTS:

1. The EC shall perform acceptance demonstrations to prove satisfactory performance characteristics of the electrical and auxiliary systems.
2. The acceptance demonstration shall be conducted in the presence of Engineer/Owner and all faults discovered therein shall be immediately corrected.
3. Acceptance Tests - Leave the entire electrical system installed under this contract or remaining in service, in proper working order. Upon completion of the installation, an acceptance test shall be run under the direction of Owner's representative to ascertain that starters, circuit breakers, motors, relays, indicating lights, pushbuttons, alarm devices and other electrical equipment and controls are operating correctly as required for the overall operation of the facility. Labor or materials required to put defective items in proper operating conditions shall be at the Contractor's expense.
4. Furnish labor, instruments, products, power and fuel required for tests.
5. Correct deficiencies found as a result of tests, at no expense to the Owner.
6. Submit certified reports indicating full compliance with test requirements.
7. Make replacements or repairs to tested products which are damaged as result of tests.
8. Schedule tests at a time convenient to required witnesses or persons affected by the tests.

9. Where specified, give written notification for test procedures, prior to the test.
10. Upon completion of the work and prior to the thermal scan, recheck electrical connections, cable to buss, cable to panels, buss to buss, throughout the job for tightness. All existing cable and bus connections in original equipment still in service shall be checked and tightened if necessary.
11. Test electrical systems grounding prior to completion of the work. Note ground resistance together with method of testing. Ground resistance shall not exceed specified or code requirements, whichever is the lower resistance.
12. Failures or improper operations shall be corrected. Furnish necessary test equipment and pay cost of testing, replacing, and repairing.
13. Testing and Adjusting of Owner's Equipment:
  - a. Test and adjust to insure correct functional performance, and correct defects or damages before connecting to electrical system.
  - b. Wiring shall be tested for continuity, short circuits and improper grounding.
  - c. Check motors for proper rotation.
  - d. If faults are detected, the fault shall be located and brought to the attention of the Owner. Corrections of faults within Owner furnished equipment will be done by Change Order.
  - e. Furnish labor, instruments, products and power required for the test.

F. DEMONSTRATIONS:

1. The EC shall demonstrate to the Owner's authorized personnel the essential features of the electrical systems and auxiliary systems.
2. The systems shall be demonstrated as required by Owner.
3. The demonstration of the work installed by the EC shall be held by the EC in the presence of the Owner or his designated representative, the Engineer and the major equipment manufacturer's representative.

G. OPERATION PRIOR TO COMPLETION:

1. The owner may require operation of parts or all of the installation for the beneficial occupancy prior to final completion and acceptance of the work.
2. The operation shall not be construed to mean final acceptance of the work by the owner.

PART 3 - EXECUTION

A. START-UP PERSONNEL:

1. The Electrical Contractor shall provide the owner start-up personnel at time of original store opening to assure smooth start-up. This should be a minimum of 40 hours for one electrician.
2. The Electrical Contractor shall be present and participate in the store start-up and testing activities at the time of the store opening. The EC shall be responsible for the proper operation of the normal electrical service, panelboards, transformers, distribution equipment, feeders and all equipment,

devices and conductors installed or terminated under this project.

- B. The Electrical Contractor shall provide the Owner a written report of all tests as part of the request for final payment.

PANEL \_\_\_\_\_  
VOLTAGE  
PHASE A-B \_\_\_\_\_  
PHASE B-C \_\_\_\_\_  
PHASE C-A \_\_\_\_\_  
PHASE A-N \_\_\_\_\_  
PHASE A-G \_\_\_\_\_  
PHASE B-N \_\_\_\_\_  
PHASE B-G \_\_\_\_\_  
PHASE C-N \_\_\_\_\_  
PHASE C-G \_\_\_\_\_

AMPERAGE

PHASE A \_\_\_\_\_  
PHASE B \_\_\_\_\_  
PHASE C \_\_\_\_\_

PANEL \_\_\_\_\_  
VOLTAGE  
PHASE A-B \_\_\_\_\_  
PHASE B-C \_\_\_\_\_  
PHASE C-A \_\_\_\_\_  
PHASE A-N \_\_\_\_\_  
PHASE A-G \_\_\_\_\_  
PHASE B-N \_\_\_\_\_  
PHASE B-G \_\_\_\_\_  
PHASE C-N \_\_\_\_\_  
PHASE C-G \_\_\_\_\_

AMPERAGE

PHASE A \_\_\_\_\_  
PHASE B \_\_\_\_\_  
PHASE C \_\_\_\_\_

DATE: \_\_\_\_\_

TIME: \_\_\_\_\_

WEATHER CONDITIONS: \_\_\_\_\_

END OF SECTION 26 00 22

SECTION 26 01 10 - CONDUIT & FITTINGS

PART 1 - GENERAL

A. GENERAL

1. All conduits shall comply with the standards of the National Electrical Code.
2. Conduit shall be the products of Allied, Wheatland, Triangle, Robroy, Carlon or approved equal.
3. In MC type cable and Modular wiring systems, use EMT conduit wiring systems for all home runs.

B. RELATED DOCUMENTS

1. All drawings and applicable provisions of Division 0 Bidding Requirements and Division 1 General Requirements apply to work of this Section.
2. Section 260000 - Electrical General Provisions.
3. Section 260012 - Basic Electrical Materials and Methods.

C. SUBMITTALS

1. Submit shop drawings and product data under the provisions of Section 26000.

PART 2 - DESCRIPTION

A. MATERIALS

1. Intermediate (IMC) - Article 345 of NEC, Intermediate Metal Conduit.
2. RIGID - Article 346 of NEC, Rigid Metal Conduit.
3. EMT - Article 348 of NEC, Electrical Metallic Tubing.
4. Non-metallic - Article 347 of NEC, Rigid non-metallic conduit.
5. FLEXIBLE - Article 349, 350 and 351 of NEC, Flexible Metal Conduit and Liquid Tight Metal Conduit as applicable.
6. All conduits shall be hot dipped or electro-galvanized steel unless otherwise noted. Minimum size conduit shall be 3/4", except switchlegs which may be 1/2". Minimum size conduit in concrete or masonry shall be 3/4". All rigid conduit shall be threaded type, fittings shall be threaded type; set screw type will not be accepted.
7. EMT connectors and couplings shall be of the compression or tap-on type with insulated throat as manufactured by the Tomic, Rayco or Efcor Company. All fittings shall be made up tight. Set screw fittings will be allowed if made from stamped steel. Cast set screw fittings will not be allowed. Fittings for lighted shelves shall be saddle type connectors.
8. Where conduit system is used as equipment grounding conductor as allowed by the NEC, all fittings couplings, bushings and connectors shall be approved for that use.

## B. APPLICATION

1. Indoor, Exposed or Concealed Areas - Use EMT for sizes up to 4", use RIGID for 5" and above, unless otherwise noted, and Rigid where exposed to physical damage and where subject to moisture and deterioration.
2. Buried in Concrete Floor Slab System - PVC Schedule 40 and shall be covered with a minimum of 1" concrete above conduit.
3. Flexible metal raceways shall be used for connection to all motorized equipment, transformers and equipment subject to vibration, adjustments and/or movement and to control equipment requiring piping connections. Raceways shall be as manufactured by Anaconda.
  - a. Connections to motorized equipment shall be made having sufficient slack between conduit and motor terminal box to assure minimum vibration transmission and field adjustments. When connecting to equipment on exterior of the building flexible raceways shall be of the weatherproof type "UA" Sealtite as manufactured by Anacoda.

## C. ROUTING OF CONDUITS

1. Conduits from utility transformers shall be routed underground to the interior of the building. If these conduits are exposed before they enter the main service gear, they shall be encased with concrete unless otherwise indicated on the plans.
2. All feeders from the main switchboard shall be routed overhead to panels or other equipment as indicated on the plans. These conduits shall not be buried in the floor unless otherwise indicated on the plans.
3. All power wiring branch circuits shall be run overhead from the panelboard to a junction box located above the ceiling in an accessible location central to the devices served by the circuits. **Contractor shall submit a shop drawing showing the location of all junction boxes to be used for homeruns.** Circuits may be extended from this point, to the load, in MC cable, except where otherwise indicated. **MC cables shall not be allowed to be used as a homerun.** All circuits run in columns and walls to below floor to be EMT to a point within 12 inches of the floor where they may continue in rigid steel or PVC or as otherwise detailed on the drawings.

## III. PART 3 - EXECUTION

- A. A complete continuous raceway shall be provided for pulling and installation of wires. All wiring shall be run in raceways unless otherwise indicated. All conduit must be reamed after cutting.
- B. Conduits shall be cut square, reamed to full size, shouldered without butting into couplings or fittings. The thread shall be of standard length and diameter required for the size of conduit used, an approved Type of graphite bearing thread lubricants shall be used in making up the threads. Where conduits are cut in the field, use a standard cutting die with 3/4" taper per foot. Running threads will not be acceptable. Conduits shall have a smooth interior surface free of obstructions, shall be capped with approved conduit seals during construction period, shall be uniformly sloped to eliminate trapped condensation, shall be thoroughly cleaned and dry before pulling any wire. Conduit installation shall clear all hot pipes such as hot water, etc., not less than 6".
- C. All conduits in finished areas shall be concealed, unless otherwise indicated on the plans. Conduits in equipment room and unfinished storage areas may be exposed.
- D. All exposed conduit shall be installed perpendicular or parallel to building lines.

- E. Expansion fittings shall be provided at all conduits across a building expansion joint. Fittings shall be type "AX" or "EX" as made by O.Z. Electrical Company, or approved equal. Provide copper bonding jumper at each expansion fitting.
- F. Bushings shall be used where conduits enter panel boxes. Bushings for No. 4 wire or larger shall be of insulated type with provisions for grounding as type "BL" made by O.Z. Electrical Company, or approved equal.
- G. All concealed conduits installed above suspended ceiling shall be run close to the underside of construction above, and shall be coordinated with the HVAC, Plumbing, and Sprinkler systems to allow room for running ducts and piping.
- H. Provide flexible conduit connection as required by NEC for all recessed lighting fixtures. Flexible conduit connection shall be as described in NEC section 410.67, (C) and 350.30 (A) Exception 3.
- I. Open end of conduits shall be capped with plastic cap during roughing-in so as to prevent the accumulation of dirt and moisture condensation in the conduit.
- J. Support for conduit 1" and smaller shall be 1 or 2 hole pipe straps spaced at not to exceed 8'-0" intervals and within 18" of an outlet box, junction box, pullbox or terminal cabinet. Support for conduit larger than 1" shall be 2 hole pipe straps. Where the conduit runs are grouped, conduit trapezes supported on 3/8" diameter rods shall be used.
  - 1. The conduit trapezes shall be made up of suitable Unistrut or Kindorf fittings, or equal, in accordance with the manufacturer's recommendations. The trapezes shall be spaced not more than 8 feet apart.
  - 2. Fastening devices to underside of roof deck shall not be permitted. All suspension and/or fastening devices shall be suspended from structure above with adequate structural steel support or angle iron.
- K. Where conduits pass through walls of supply plenums, entry shall be sealed with materials approved by Engineer.
- L. Rigid and IMC conduit couplings shall be threaded type and 3 piece type union. Compression couplings or running thread couplings will not be accepted.
- M. Joints in rigid conduit installed in concrete or masonry shall be made liquid tight and shall engage not less than five threads.
- N. Conduit in concrete shall be placed so that no portion of the conduit or couplings are exposed and at a sufficient depth to prevent cracking or spalling. Only service entrance conduits and branch circuit conduits shall be run in or under concrete slabs. All feeders from main electric room to electric closets shall be run above ceiling.
- O. Connections to Wiring Enclosures - Conduits shall be secured to outlet boxes or wiring enclosures with double lock nuts and bushings. Where conduit boxes with threaded hubs are used, conduit shall engage at least five threads in the hubs.
- P. No more than the equivalent of four quarter bends (360 degree total) shall be made in conduit run between outlets, pull boxes, junction boxes or panels. Runs over 100 feet shall have pull boxes.
- Q. Where type MC cable is used above lay-in ceilings, it may be supported and secured to the hangers for the ceiling at intervals not exceeding 6 feet, using metal clips made for the purpose. Cable installation shall not effect the ceiling's appearance, nor shall it cause any deflection in the hanger wires.
- R. Any wiring (EMT, MC, etc.) installed above lay-in ceilings shall be installed so as to not interfere with the ability to remove ceiling panels from the ceiling.

S. Low Voltage Systems

1. Provide a complete raceway system consisting of EMT, junction and device boxes for Fire Alarm System cabling.
2. Provide conduit stub-ups complete with boxes, pull strings and insulated bushings to the nearest accessible ceiling for all other low voltage systems.
3. All cables routed over inaccessible ceilings shall be run in conduit. EC shall provide all required conduits. Coordinate conduit sizes and locations with owner's representative and applicable trades.

END OF SECTION 26 01 10



SECTION 26 01 20 - CONDUCTORS

PART 1 - GENERAL

- A. All wiring shall be insulated and comply with the latest specifications of the NEC. All conductors shall be 600V soft drawn, annealed, 98 percent conductivity copper, except as noted on one line diagram. Wire and cable shall be new, shall have size, type of insulation, voltage rating and manufacturer's name permanently marked on outer covering at regular intervals. All wiring shall be in conduit except 24 volt systems and below, unless otherwise indicated. MC cable will be accepted in lieu of a conduit wiring system, provided that at all other conditions of this section and Section 260110 - "Conduit and Fittings" are met. Type MC cable shall not be permitted for cash wrap circuits, nor for any circuits concealed in columns or floor.
- B. Aluminum conductors are not acceptable.
- C. WORK INCLUDED
  - 1. Building wire.
  - 2. Cable.
  - 3. Wiring connections and terminations.
- D. SUBMITTALS
  - 1. Submit shop drawings and product data under the provisions of Section 260000.
  - 2. Submit manufacturer's instructions.
  - 3. Submit manufacturer's instructions for splicing and terminating aluminum conductors.
- E. RELATED DOCUMENTS
  - 1. All drawings and applicable provisions of Division 0 Bidding Requirements and Division 1 General Requirements apply to work of this Section.
  - 2. Section 260000 - Electrical General Provisions.
  - 3. Section 260012 - Basic Electrical Materials and Methods.

PART 2 - DESCRIPTION

- A. Unless otherwise called for, the insulation of cables and wires shall be as follows:

<u>Applications</u>	<u>Types of Wires and Cables</u>
1. Feeders to panelboards	Type THWN/THHN, or XHHW-75°C
2. Branch circuits	
a. for sizes #6 and larger	Type THWN/THHN, or XHHW-75°C
b. smaller than #6	Type THWN/THHN 75°C, 90°C

3. Fire Alarm Plenum rated meeting requirements of NEC 725 and/or 760, size and shielding requirements as determined by system supplied. Red outer jacket.

4. EMS System Conductors ORANGE CABLE

- a. Line voltage wire for powering EMS panels shall be #12, 3 conductors in conduit connected to a constant (24 hour) circuit.
- b. Low voltage wire for EMS shall be as shown on EMS plans. Outer jacket color shall be ORANGE.

B. Branch circuit conductors #10 or smaller shall be solid.

C. Conductors #8 and larger shall be stranded.

D. All branch circuits shall be a minimum of #12 wire. 120 Volt branch circuits longer than 100 feet shall be a minimum #10; longer than 200 feet shall be a minimum of #8. 208 volt or 277 volt branch circuits longer than 200 feet shall be a minimum of #10. Control wiring shall be a minimum of #14 AWG wire unless noted otherwise.

E. All wires shall be installed in accordance with NEC. Code approved pressure type connectors such as "Ideal Wing-Nut" may be used for sizes #10 and smaller. Terminals, taps and splices in wire #8 and larger shall be made with solderless compression type connectors. All joints or splices shall be wrapped with insulating tape so that the insulation of the joint, etc., shall not be less than the insulation of the wire.

F. METAL CLAD CABLE

- 1. Flexible Armored Cable, Size 14 Through 6 AWG: Copper conductor, 600 volt thermoplastic insulation, rated 90 degrees C, Type MC cable may be used for branch circuit runs to individual devices. Home runs are to be EMT conduit. Branch circuit runs to cash wrap outlets and all branch circuits in floors and columns shall be run in EMT. Type MC cable shall be permitted in runs in ceilings, between J boxes feeding conduits to wiring devices and store fixtures.

G. COLOR CODE

- 1. All branch circuits shall be color coded in accordance with NEC and shall be:

<u>277/480 Volt</u>	<u>120/208 Volt</u>	<u>Use</u>
Brown	Black	Phase A
Orange	Red	Phase B
Yellow	Blue	Phase C
White-Brown Tracer	White	Neutral

- 2. Large cables need not be color coded throughout but each conductor shall be identified at each end and at all junctions and pull boxes by means of painting or color taping.

- 3. All auxiliary systems shall be color coded in accordance with system manufacturer's recommendations or in a manner approved by the Engineer/Owner's representative.

## H. CABLE IDENTIFICATION

1. The EC shall label all fire alarm and security cables. Identify by system type and cable run.

## PART 3 - EXECUTION

- A. No conductors or cables shall be installed in Raceways until the Raceway system has been completed. When installing conductors, the EC shall exercise due care to prevent damage to conductor or insulation. Only approved cable lubricants shall be used when necessary. Mechanical means shall not be used in pulling wire #8 or smaller.
- B. All feeder cables shall be continuous from origin to panel or equipment termination without running splices in intermediate pull or splice boxes. Where taps and/or splices are necessary and approved, they shall be made in approved splice boxes with suitable compression type connectors as noted herein.
- C. Unless otherwise noted, each feeder raceway shall contain only those conductors constituting a single feeder circuit.
- D. All branch circuit cable terminations, taps and splices #8 and smaller shall be made with solderless spring type connectors such as "Scotchlok" or "Wingnut".
- E. Compression type connectors are required on branch circuits and feeder cables #6 and larger and shall be of the type as manufactured by the Burndy Company and shall be installed with approved hydraulic tools to assure a permanent mechanically secure high-conductivity joint.
- F. All insulated splices, joints and free ends of conductors shall be covered with rubber and friction tape or high-dielectric polyvinyl-chloride Scotch 33 Electrical Tape. Insulation value to be same as wire insulation.
- G. Connection to Ground Conductor No. 1/0 and larger shall be made by Cadweld or Burndy Exothermic Process.
- H. Where conductors are connected to metallic surfaces, the coated surfaces of the metal shall be cleaned to the bare metal before installing the connector. Lacquer coating of Raceways shall be removed where ground clamps are to be installed.
- I. All conductors shall be installed such that when panel covers are removed or switch doors are open, the conductor size can be easily read. All conductors shall be installed and terminated in a neat and workmanship like manner.

## J. WIRING CONNECTIONS AND TERMINATIONS

1. Splice only in accessible junction boxes.
2. Terminate wire in accordance with manufacturer's instructions.
3. Use solderless pressure connectors with insulating covers for copper wire splices and taps, 8 AWG and smaller. (For 10 AWG and smaller, use insulated spring wire connectors with plastic caps.)
4. Use split bolt connectors for copper wire splices and taps, 6 AWG and larger. Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of conductor.
5. Thoroughly clean wires before installing lugs and connectors.

6. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.
  7. Terminate spare conductors with electrical tape.
- K. Tags shall be attached to wiring at every point where conduit runs are broken or terminated (junction boxes, pull boxes, pole bases, etc.). Circuits and functions shall be indicated. Tags shall be embossed, self-attached metal ribbon of stainless steel or brass.
- L. INSTALLATION OF FIRE ALARM CABLING
1. Install cables in conduit supported from the building structure a minimum of 8 inches above ceilings by supports per NEC requirements. Conduit shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.
  2. Only fire cables shall be run in the same conduit. Other power and low voltage wiring shall be run in separate supports. Separation between Fire Alarm cables and unshielded power conductors and electrical equipment shall be a minimum of 24 inches.
  3. Provide Caddy Cat Links or equivalent J-hook tree style cable supports in a grid pattern as indicated on the plans. Provide (1) 4" J-hook and (4) 2" J-hooks supported from each other and structure for future use by owner and owner's vendors.

END OF SECTION 26 01 20

SECTION 26 01 31- WIREWAYS, OUTLETS, AND BOXES

PART 1 - GENERAL

A. GENERAL

1. The EC shall supply all wireways, outlets and junction boxes necessary whether shown on drawings or not.

B. RELATED DOCUMENTS

1. All drawings and applicable provisions of Division 0 Bidding Requirements and Division 1 General Requirements apply to work of this Section.
2. Section 260000 - Electrical General Provisions.
3. Section 260012 - Basic Electrical Materials and Methods.

PART 2 - DESCRIPTION/EXECUTION

A. WIREWAYS (Not Applicable)

B. OUTLET AND SWITCH BOXES

1. General - All outlet and switch boxes shall be NEC approved type, size to provide ample space for wiring devices, conductors, and grounding wires and shall comply with the following:
  - a. Where space is available, all feed through boxes shall be minimum 4" square by 1½" deep. Boxes shall be set back to allow the installation of a square cut and raised adapter ring. Depth of raised portion shall match the wall construction.
  - b. When more than one wiring device (switches and receptacles) is shown on the same location, gang boxes shall be used.
  - c. When wiring devices (switches and receptacles) are shown side-by-side with special wiring devices (such as lighting dimmers, special systems or exhaust fan switches), separate boxes shall be installed for these special devices in order to allow the proper clearance for installing these special device covers.
  - d. Where installed in thin wall partition (2½" or less), 1" deep box RACO No. 403 of the appropriate size may be used.
  - e. Where shown for installation in hollow metal supports, door jambs, or other location where space is limited, boxes shall be RACO No. 426, 427 (2 gang tandem), 428 (3 gang tandem) or equal.
  - f. Where drawings show back-to-back wiring devices, the devices on opposite side of the wall shall be offset a minimum of 12" so that each device will be installed in separate box to avoid sound transmission between adjacent rooms. Through-the-wall boxes shall not be used.
  - g. Where any device is installed with exposed conduit, the outlet box shall be Type "FS".
  - h. Wall boxes for flush exterior use, hot-dipped galvanized complete with lockable weatherproof cover and rubber or neoprene gasket.

- i. Owner's Option to Relocate Outlets - See General Conditions of Electrical Specification.
  - j. Convenience outlets mounted in brick walls shall be mounted in horizontal position and located at nearest joint and shall be masonry type.
2. Manufacturers - Boxes shall be products of RACO, Appleton, Crouse- Hinds, Russel Stoll or approved equal.

A. PULL AND JUNCTION BOXES

1. Pull and junction boxes are not completely shown on plans. They shall be installed where required in accordance with National Electrical Code (NEC).
2. Boxes for concealed conduit runs shall be concealed above accessible ceilings or behind access panels. In locations where exposed conduits are permitted, boxes shall be surface mounted.
3. All boxes shall be constructed of minimum No. 14 gauge hot-dipped galvanized steel, cast or sheet aluminum with screwed or hinged cover. Fasteners shall be brass or zinc coated screws. Where exposed to weather, moisture-tight gasket shall be provided.
4. Location of concealed boxes shall be indicated on the "Record" drawings for Owner's record.
5. Boxes shall be accessible at job completion. Boxes with covers in finished areas shall be in those physical locations approved by the Architect.

PART 3 - EXECUTION

A. INSTALLATION

1. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
2. Complete raceway installation before starting conductor installation.
3. Arrange stub-ups so curved portions of bends are not visible above the finished slab.

END OF SECTION 26 01 31

## SECTION 26 01 40 - WIRING DEVICES

### PART 1 - GENERAL

#### 1.1 GENERAL

1. All wiring devices shall be of the type indicated below. Color of devices and plates shall be grey unless noted otherwise.
2. Devices shall be Pass and Seymour, General Electric, Leviton, Hubbell, Eagle, or approved equal.

#### 1.2 RELATED DOCUMENTS

1. All drawings and applicable provisions of Division 0 Bidding Requirements and Division 1 General Requirements apply to work of this Section.
2. Section 260000 – Electrical General Provisions.
3. Section 260012 – Basic Electrical Materials and Methods.

#### 1.3 SUBMITTALS

1. Submit shop drawings and product data under provisions of Section 260000.

### PART 2 – DESCRIPTION

#### 2.1 SWITCHES

1. Toggle switches shall be UL listed and conform to NEMA standards, as well as the latest Federal Specification W-S896d.
  - a. Toggle, single pole - P & S 20AC1.

#### 2.2 CONVENIENCE OUTLETS

1. Conventional type, duplex, 3 wire, grounding type, side and back wired, NEMA 5-20R. Pass & Seymour 5362.
2. Conventional type with two (2) USB charging ports, duplex, 3 wire, grounding type, side and back wired, tamper-resistant with USB charging port, NEMA 5-20R. Pass & Seymour TR5362USB.
3. Interior duplex ground-fault interrupter receptacles shall be NEMA 5-20R, equal to Pass & Seymour 2095.
4. Outlet colors:
  - a. All outlets in all Sales and Fitting Room areas shall be gray except for outlets on the ceilings unless otherwise indicated on the drawings.
  - b. All outlets in all Sales areas ceilings shall be white.
  - c. Storage Rooms and Unfinished Areas shall be gray unless otherwise indicated on the drawings.
  - d. Mechanical Rooms shall be gray unless otherwise indicated on the drawings.

## 2.3 COVERPLATES

1. General - Coverplates shall accommodate the devices installed in the outlet boxes. Where more than one device is indicated at the same location, a ganged plate shall be used. All plates shall be compatible with the device configuration. Install in each and every outlet box, as indicated on the drawings, a wiring device and cover plate.
2. FINISH:
  - a. Finished Areas
    - (1) Plates in all Sales areas except on ceilings shall have brushed stainless steel plates. Mulberry Metal Products, Union, N.J. or equal.
    - (2) Plates in all Sales areas ceilings shall be white plastic. Mulberry Metal Products, Union, N.J. or equal.
  - b. Storage Rooms and Unfinished Areas - Pass and Seymour or equal, brushed stainless steel for all flush boxes and galvanized metal for all exposed boxes.
  - c. Mechanical Rooms - Galvanized metal for all exposed boxes and Pass and Seymour or equal, brushed aluminum for all flush boxes.
  - d. All ceilings - Pass and Seymour 99101, White, coated baked- on insulated enamel finish on steel plate.

## 2.4 OCCUPANCY SENSORS:

1. Electrical Contractor shall provide back boxes and occupancy sensors with control unit. All sensors shall be located a minimum of four feet from all HVAC air devices.
2. Mounting heights for sensors in rooms without ceilings (stock rooms, loading dock) shall be a maximum of 16' AFF.
3. Occupancy Sensor Schedule: Refer to Lighting Control Legend on drawing E201.

## I. PART 3 – EXECUTION

- A. INSTALLATION Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.
  1. Coordination with Other Trades:
    - a. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
    - b. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
    - c. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
    - d. Install wiring devices after all wall preparation is complete.



2. Conductors:
  - a. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
  - b. Existing Conductors:
    - (1) Cut back and pigtail, or replace all damaged conductors.
    - (2) Straighten conductors that remain and remove corrosion and foreign matter.
    - (3) Pigtailing existing conductors is permitted provided the outlet box is large enough.
3. Device Installation:
  - a. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
  - b. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
  - c. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
  - d. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
  - e. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
  - f. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
  - g. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
  - h. Tighten unused terminal screws on the device.
  - i. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.
4. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
5. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.
6. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

## B. IDENTIFICATION

1. Comply with Division 26 Section "Basic Electrical Material and Methods."

END OF SECTION 26 01 40

SECTION 26 01 70 - SAFETY SWITCHES

PART 1 - GENERAL

A. GENERAL

1. Refer to Equipment Schedules on the mechanical drawings for controller types and division of responsibility.

A. RELATED DOCUMENTS

1. All drawings and applicable provisions of Division 0 Bidding Requirements and Division 1 General Requirements apply to work of this Section.
2. Section 260000 - Electrical General Provisions.
3. Section 260012 - Basic Electrical Materials and Methods.

B. SUBMITTALS

1. Submit shop drawings and product data under the provisions of Section 260000.

PART 2 - DESCRIPTION

A. SAFETY SWITCHES

Disconnect switches for single and three phase loads over 1000 watts or 1/2 horsepower shall be horsepower rated, heavy duty, quick-make, quick-break as manufactured by Challenger, ITE, Square D, Cutler Hammer, General Electric, or approved equal.

1. Disconnecting devices for single phase loads 1000 watts and smaller shall be 15A AC switches as specified under wiring devices.

END OF SECTION 26 01 70

SECTION 26 04 50 - GROUNDING

PART 1 - GENERAL

A. GENERAL

1. Provide a grounding system including all fittings, clamps, conduit and wire of proper size to make ground connections between all apparatus and conduits and building steel as required by applicable edition of National Electrical Code and according to requirements of local utility company. Grounding wires shall not be run in conduit unless No. 6 copper or smaller. When installed in steel conduit, ground wires shall be bonded to each end of conduit.
2. Sizes and types of grounding conductors, ground clamps, bonding jumpers, conduits, fittings and methods of securing same to obtain electrical continuity, in accordance with Article 250 of NEC.
3. Grounding electrodes of system grounds and equipment grounds shall be solidly bonded together to avoid any difference in potential.
4. Equipment grounding shall consist of connecting all non-current carrying metal parts of the wiring system to a ground source. This includes the conduit or other steel raceways, boxes and similar components as well as metal enclosures of equipment.

B. RELATED DOCUMENTS

1. All drawings and applicable provisions of Division 0 Bidding Requirements and Division 1 General Requirements apply to work of this Section.
2. Section 260000 - Electrical General Provisions.
3. Section 260012 - Basic Electrical Materials and Methods.

PART 2 - DESCRIPTION

A. MANUFACTURERS

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Chance: A. B. Chance Co.
  - b. Erico, Inc.; Electrical Products Group.
  - c. Ideal Industries, Inc.
  - d. ILSCO.
  - e. O-Z/Gedney Co.
  - f. Raco, Inc.
  - g. Thomas & Betts.

B. GROUNDING AND BONDING PRODUCTS

1. Governing Requirements: Where types, sizes, ratings and quantities indicated are in excess of National Electrical Code requirements, the more stringent requirements and the greater size, rating and quantity indications govern.

C. SERVICE GROUND

1. Existing grounding electrode system to remain.
2. EC shall make grounding electrode connections from transformer "TS" to building steel as required by National Electrical Code.

D. ELECTRICAL EQUIPMENT GROUNDING

1. The equipment grounding system shall consist of electrically continuous metallic conduit or code sized equipment ground wires. Every item of equipment served by the Electrical System shall be bonded to the equipment grounding system.
2. Provide a properly sized insulated grounded conductor with each branch circuit installed in a nonmetallic conduit regardless of whether or not the ground wire is shown on the plans. Bond conductor to electrical equipment served by feeder and to ground bus in main switchboard.
3. Motors shall be grounded by connecting a conductor from the motor frame to the grounding terminal on the connector for rigid to flexible conduit. Ground conductor shall be at least fifty percent (50%) of total copper per phase of feeder to motor with minimum size No. 12 AWG wire.
4. All neutral conductors shall be continuous throughout the system and shall be grounded only at the transformer of separately derived systems, or at the service neutral at the main switchboard.
5. All receptacles shall have provisions for grounding and shall be grounded to the outlet box, or to a separate ground conductor where plastic conduit is used.

PART 3 - EXECUTION

- A. EC shall provide all necessary grounds, ground grids, and building steel ground connections.

END OF SECTION 26 04 50

SECTION 26 05 00 - GENERAL PROVISIONS FOR LIGHTING.

PART 1 - GENERAL

A. GENERAL

1. Unless otherwise indicated on the drawings, lighting fixtures shall be furnished and installed by the Electrical Contractor (EC).
  - (1) The Contractor is responsible for coordinating recessed luminaires with the ceilings into which they are to be installed, regardless of the manufacturers' product numbers specified and ordered by the Owner. The Contractor will receive a set of submittal drawings illustrating each Luminaire Type to facilitate his review.
  - (2) Recessed LED luminaires are specified to include provision for thru-branch circuit wiring. Contractor must verify suitability of each luminaire relating to circuit wires and local code requirements.
2. The EC will install all lighting fixtures and lamps as indicated on the plans and as herein specified or indicated on the Electrical Detail Plan. All miscellaneous straps, channels or other supporting devices required for ceiling mounted fixtures shall be provided by the EC.
3. Fixture schedule includes type designation, lamp information, type of mounting, manufacturer, catalog number and special requirements.
4. Catalog number specified in the schedule is for identification of the type of fixture only. It does not necessarily represent the special required features. Shop drawings shall be required for all fixtures with special requirements properly identified.
5. Locations of fixtures on electrical drawings are diagrammatic. Verify location and spacing with architectural reflected ceiling plans, dimensioned location drawings, and other reference data before installation. Coordinate space conditions including heat loop clearance, and interferences with ceiling components such as ducts, openings, beams and piping prior to installation.
6. EC shall be responsible for coordinating and marking location of all drywall lighting fixtures for framing by Ceiling Contractor where applicable, i.e., fixture locations shall be marked on floor by EC if requested by Owner's representative so Ceiling Contractor can plumb as required.

A. RELATED DOCUMENTS

1. All drawings and applicable provisions of Division 0 Bidding Requirements and Division 1 General Requirements apply to work of this Section.
2. Section 260000 - Electrical General Provisions.
3. Section 260012 - Basic Electrical Materials and Methods.

## SUBMITTALS

1. Submit shop drawings and product data for EC-provided lighting fixtures under the provisions of Section 260000.

## PART 2 - DESCRIPTION

### A. SUBSTITUTIONS

1. Shop drawings and at least one sample shall be required for all substitutions. Fixtures shall conform to the general construction and appearance of the fixtures specified and/or detailed on the drawings. The exact details of construction shall be left to the fixture manufacturer, subject to the approval of the Architect/Engineer/Owner.

### B. U.L. LISTING

1. All fixtures shall bear U.L. Listing (if of the type tested).

## PART 3 - EXECUTION

- A. The EC shall include costs for the handling and installation of all fixtures.

### B. INSTALLATION

1. All fixtures shall be provided with the proper mounting trims for the ceiling construction installed. Contractor shall install all supporting and anchoring straps, yokes or other mounting devices as recommended by the fixture manufacturer.
2. No fixture shall be supported directly from the ceiling tile or from duct work or piping.
3. Where fixtures are designed to be supported by suspended ceiling systems such as plaster, exposed T-bar and concealed spline, the system as installed by the Ceiling/Drywall Contractor shall support the fixture.
4. Lighting fixtures recessed into plaster ceiling shall be provided with plaster frame for installation by the Ceiling subcontractor. Frames for LED downlight fixtures shall be installed by the EC.
5. EC shall note that fixture selections specified in the Fixture Schedule are based on the ceiling construction contemplated at the time of design. Final ceiling construction as submitted by the subcontractors may be somewhat different than the type specified. EC shall be required to confirm the ceiling construction with the Owner.
6. Fixtures mounted on low density fiberboard ceiling material shall conform to Article 410-76 of the latest edition of the NEC.
7. Reflector cones, baffles, plate and decorative elements of fixtures shall not be installed until completion of plastering, ceiling tile work, hanging, painting, and general cleanup of the area.
8. Blemished, damaged, or unsatisfactory fixtures shall be replaced or repaired by EC at no cost to the Owner.
9. Verify location and spacing with architectural reflected ceiling plans, and other reference data before

- installation. Coordinate space conditions including heat loop clearance, and interferences with ceiling components such as ducts, openings, beams and piping prior to installation.
10. EC shall be responsible for coordinating and marking location of all drywall mounted lighting fixtures for framing by Ceiling Contractor, i.e., fixture locations shall be marked on floor by EC so Ceiling Contractor can plumb as required.
  11. Install grid clips to support ceiling mounted luminaires to the ceiling grid.
  12. All 2x2 fixtures shall be installed with matching lamp orientation. Downlight fixtures with asymmetrical lighting pattern shall be installed with lamp orientation in the same direction.

END OF SECTION 26 05 00

SECTION 26 05 01 - LAMPS AND BALLASTS

PART 1 - GENERAL

A. GENERAL

1. In general, lamps shall be furnished and installed by the EC.

B. RELATED DOCUMENTS

1. All drawings and applicable provisions of Division 0 Bidding Requirements and Division 1 General Requirements apply to work of this Section.
2. Section 260000 - Electrical General Provisions.
3. Section 260012 - Basic Electrical Materials and Methods.

PART 2 - DESCRIPTION

A. LAMPS

1. Install all lamps at time fixtures are mounted.
2. Lighting fixture schedule shall take precedence over this specification where they differ.

B. BALLASTS (Fluorescent/Mercury/Metal Halide)

1. Not Applicable.

PART 3 - EXECUTION

A. INSTALLATION

1. In fixtures using lamps with asymmetrical beams, lamp adjustment devices shall be set to insure permanent orientation of light beam, and shall not be affected by relamping.
2. EC shall replace all burned out lamps and defective ballasts on a one-time basis prior to store opening.

END OF SECTION 26 05 01



SECTION 26 05 29 - SEISMIC RESTRAINT

PART 1 GENERAL

1.01 SCOPE

- A. Electrical equipment, light fixtures, conduit, cable tray and other components provided in this project shall be constructed, supported and installed to comply with seismic restraint requirements outlined in the Local Building Codes.
- B. Reference standards shall include latest editions of SMACNA Seismic Restraint Manual, including Appendices A thru E, for conduits. Standards for bracing steel and attachments shall be:

American Society of Testing Materials (ASTM):

ASTM A36	Structural Steel
ASTM A307	Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
ASTM A325	Structural Bolts, Steel, Heat Treated, 120/105 KSI minimum tensile strength
ASTM A576	Steel Bars, Carbon, Hot-Wrought, Special Quality

American Society of Mechanical Engineers (ASME):

ASME B18.2.1	Square and Hex Bolts and Screws
ASME B18.2.2	Square and Hex Nuts

Federal Specification:

FF-S-325	Concrete Expansion Anchors
RR-W-410D	Wire Rope and Strand

Manufacturers Standardization Society (MSS) Standards

SP-58	Pipe Hangers and Supports – Materials, Design and Manufacture
SP-69	Pipe Hangers and Supports – Selection and Application

- C. The Contractor shall be responsible for calculation and design of seismic restraint of equipment, conduit and other items to be installed by that Contractor.
- D. Submittal data shall include details of seismic bracing and hangers and size, loading and location of supports. Procedures for installing and adjusting seismic bracing shall be included. Submittal data shall include engineering calculations with professional engineer's stamp.
- E. Seismic Restraints
  1. General: The intent of seismic restraints is to restrain electrical equipment, conduit and other items during an earthquake so that essential operations of the facility are not disrupted due to seismic failure of electrical systems and components. In addition, bracing is intended to prevent equipment from overturning and suspended equipment, lighting fixtures, conduit, etc. from swaying or falling and creating a potential life safety hazard.
  2. Seismic restraints are required for the following:

- a) Panelboards.
  - b) Light fixtures.
  - c) Communication equipment
  - d) Conduits except:
    - 1) Conduits suspended by individual hangers 12" or less in length from the top of the conduit to the supporting structure.
    - 2) Emergency system conduits 0.75" and smaller.
    - 3) Conduits (other than emergency system) 2" and smaller.
3. Conduit restraints shall conform to provisions and details of the SMACNA Seismic Restraint Manual for Seismic Hazard Level (SHL) C. Requirements for detailed calculations are waived for conduit restraints conforming to appropriate SMACNA details and requirements.
4. Project Conditions;
- a) Seismic restraints to be designed per codes and standards in effect including Chapter 16, Structural Design and SEI/ASCE 7.

## PART 2 PRODUCTS

### 2.01 STANDARDS

- A. Bracing steel and attachments, cables, concrete inserts and other attachments to the structure shall be sized for the required seismic loads.
- B. All components of restraining systems for conduits shall conform to standards stated in Part 1 - General

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Base mounted equipment shall be secured to the concrete pad. Refer to ASHRAE Guide to Seismic Restraint, Chapter 6, for housekeeping pad requirements and Chapter 11, for floor mounted equipment requirements.
- B. Spring and resilient mounted equipment shall be secured to vibration isolators, minimum of four per unit, and the isolators to the floor slab or concrete pad, in accordance with the above requirements.

Multi-directional seismic snubbers employing elastomeric pads shall be provided in conjunction with the isolators.
- C. Equipment sway bracing shall be provided for equipment suspended from overhead floor or roof structure. Bracing shall consist of angles, rods, bars or pipe run at a 45 degree angle from the equipment frame in both longitudinal and transverse directions.
- D. Light fixtures shall be supported to resist the lateral force of 23% of the fixture weight and shall be supported as follows:
  1. In addition to NEC 410-16 requirements, recessed fluorescent fixtures shall be supported to a seismic-resistant suspended ceiling support system and attached with seismic clips or bolts, at each corner of the fixture. In lieu of this, fixtures shall be provided with support wires attached

to the building structure using two wires for individual fixtures and one wire per fixture in a continuous row. Refer to 26 05 00 GENERAL PROVISIONS FOR LIGHTING.

2. Surface mounted fluorescent fixtures shall be attached with a full loop band or locking-type scissor clamp to a seismic-resistant ceiling support system or by wire attachment to the building structure similar to that for recessed fixtures.
  3. Pendant fixture hanger assemblies shall be fitted with a restraining device to hold the stem in the support position during a seismic disturbance. Fluorescent fixtures shall be fitted with flexible hanger devices at the attachments to the fixture channel to preclude breaking of the support.
  4. Outlet boxes for fixture mounting shall be braced to the building structure or seismic-resistant support system.
  5. Wall and ceiling mounted exit and emergency lights shall be secured in a manner so as to hold the unit in place during seismic disturbance.
- E. Conduits and cable trays shall be braced in both longitudinal and transverse direction. Fabrication and installation of resistant systems shall be in compliance with details of the seismic design and the SMACNA Manual.

END OF SECTION 26 05 29

SECTION 26 09 81 - COMMUNICATION SYSTEMS RACEWAY

PART 1 - GENERAL

A. GENERAL:

1. Provide rough-ins for Point Of Sale (P.O.S.) and communications systems devices as indicated on plans. Telephones, telephone switches, data racks, jacks, cables, electronics and final connections will be by owner's vendor. EC shall provide 4" square x 2-1/2" deep boxes, 1" conduit stub-up with pull string and insulated bushing and all rough-in work required.

B. RELATED DOCUMENTS

1. All drawings and applicable provisions of Division 0 Bidding Requirements and Division 1 General Requirements apply to work of this Section.
2. Section 260000 - Electrical General Provisions.
3. Section 260012 - Basic Electrical Materials and Methods.

PART 2 - DESCRIPTION

A. MATERIALS:

1. EC shall provide a complete POS/TELE/DATA rough-in system including all rough-in, conduit boxes, supports, conduits, supports, pull strings, insulated bushings and sleeves.

PART 3 - EXECUTION

A. INSTALLATION:

1. Install rough-ins in locations indicated on plans. Provide insulated bushing on end of each conduit and install pull string.

END OF SECTION 26 09 81

SECTION 28 31 11 - FIRE ALARM

PART 1 - GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Section, and all applicable provisions of Division 0 Bidding Requirements, apply to this section.

B. SUMMARY

The fire alarm system is existing to remain. Expand existing fire alarm system to provide new and relocated equipment and devices as indicated and re-program the fire alarm system as required to comply with Code and provide proper system operation.

1. Provide all required labor, warranty labor, materials, equipment, system re-programming, submittals and services necessary for a complete and operational fire alarm system as hereinafter described and as shown on the drawings.
2. Work shall begin at the source of 120 volt AC power for the existing fire alarm panel and shall include but not be limited to the following:
  - a. Intelligent / Addressable Fire Alarm Control Panel
  - b. Initiation Circuits
  - c. Notification Circuit(s)
  - d. Monitoring Circuits
  - e. Audible/Visual Appliances

C. SYSTEM DESCRIPTION

1. All new devices shown on the drawings shall be UL Rated for use in conjunction with the existing fire alarm system. Materials, wiring and equipment shall be designed and built in accordance with the best practices of the electrical industry and shall conform to the standards of:
2. The system shall continue to operate as a low voltage fire alarm system and shall be a complete, intelligent, addressable, supervised fire alarm system as hereinafter specified. Initiation circuits shall meet the minimum requirements of Class B, Style B. Supervisory circuits shall meet the minimum requirements of Class B, Style B. Notification circuits shall meet the minimum requirements of Class B, Style Y. Signaling line circuits shall meet the minimum requirements of Class B, Style 4.
3. The control panel and auxiliary power supplies are existing to remain.
4. Initiation of an "alarm" condition shall result in the following functions to be performed by the system:
  - a. Actuate all audible/visual and visual devices throughout the building.

D. QUALITY ASSURANCE

1. All work shall meet the requirements of the Owner, Owner's Insurer, Authority Having Jurisdiction (AHJ), Architect, and Engineer.

2. All equipment and components shall be Underwriters' Laboratories listed and Factory Mutual approved for the actual intended use.
3. Installation and supervision of installation shall be in strict compliance with the requirements of the regulations, licenses, and permits for fire alarm system installers in this jurisdiction.
4. Installer shall have been actively engaged in the business of selling, installing, and servicing fire alarm systems for at least five (5) years in this jurisdiction.
5. Installer shall be an authorized representative of the Fire Alarm Equipment Manufacturer (FAEM) and have technical factory training specifically for the system proposed.
6. The FAEM shall have a representative supervise the final connection of devices and wiring and programming of the control panel. This representative shall also supervise acceptance testing. The FAEM representative shall be NICET certified to Level II or higher Fire Alarm Protection / Fire Alarm Systems Engineering Technician.

#### E. REGULATORY REQUIREMENTS

1. All work shall meet the requirement of paragraph "Rule and Regulations" and all applicable codes and design standards.
2. Any work performed prior to the satisfactory review of the shop drawings by the Engineer and approval by the AHJ, and determined to be non-compliant with the contract documents or applicable codes, shall be replaced at the Contractors' expense.
3. The system shall not be accepted until final testing and receipt of the NFPA 72 Inspection and Testing Form and Record of Completion Form has been obtained.

#### F. SUBMITTALS

1. Prior to release of equipment for manufacture, fabrication, shipment or installation, submit to the Architect/Engineer the following:
  - a. One (1) electronic .pdf file or five (5) sets of shop drawings. Submittal must be comprehensive of the entire project, complete in all detail, and include, but not be limited to, the following:
    - (1) Floor plans showing equipment placement, point to point wiring, wiring types and sizes, conduit types and sizes, wiring and raceway routes. Floor plans shall be AUTOCAD generated.
    - (2) Sequence of Operations to include a detailed description of the operation of each system function for all possible alarm conditions.
    - (3) Point-to-point wiring diagrams and riser diagram.
    - (4) Supervisory and alarm current calculations for primary power and emergency battery sizing of all central panels and auxiliary power supplies being modified.
      - (a) battery calculations shall list the type of devices and modules, quantities, amperage draw for standby and alarm conditions for each device, the total amperage draw for each panel, and each panel's battery amp-hour rating.
      - (b) The calculated load shall be the design load, including all required spare capacity.
      - (c) the battery capacity used to meet the calculated load shall be a maximum of 80 percent of the amp-hour listed by the manufacturer.
    - (5) A complete list of all proposed alpha-numeric descriptions and their associated point address and circuit number.

- (6) Voltage drop calculations for notification circuits being modified.
  - b. Four (4) sets of the schedules, data, calculations and manufacturers' literature on all system equipment and system conductors. Literature shall include specification and description of recommended supporting methods, enclosures or boxes, and wiring connections.
  - c. One (1) copy of the transmittal of the permit application to the AHJ.
  - d. One (1) copy each of the qualifications and authorization of the representative of the FAEM.
  - e. One (1) copy each of all installation manuals.
2. Forward in writing, to the Engineer, any comments from the AHJ or the Insurance Underwriter within five (5) working days after the receipt of their comments.
  3. The Engineer shall review for accuracy all submittals required to be received by the Engineer prior to equipment release or installation. The Owner, or design firms retained by the Owner, shall not be responsible for any additional costs resulting from replacement of equipment or materials not reviewed prior to installation.

#### G. RULES AND REGULATIONS

1. All work shall be installed in accordance with the latest applicable codes and referenced design standards:
  - a. Refer to specification section 26 00 00.

#### H. RELATED DOCUMENTS

1. All drawings and applicable provisions of Division 0 Bidding Requirements and Division 1 General Requirements apply to work of this Section.
2. Section 260000 - Electrical General Provisions.
3. Section 260012 - Basic Electrical Materials and Methods.
4. Section 260110 - Conduit and Fittings.

#### I. PROJECT AS-BUILT DOCUMENTS

1. The contractor shall continually document software and programming changes. This documentation shall include:
  - a. A complete printout of the system prior to the change.
  - b. A complete printout of the system program subsequent to the change, with all modifications highlighted.
  - c. A letter prepared and signed by the individual who made the changes, describing each change made and the reason for the change. This letter shall certify that the programmer has personally reviewed and compared the before and after program printout and verified the correctness of the modification(s).
  - d. An equivalent means performed automatically in computer software, which verified the results of changes made is acceptable.

2. The contractor shall include sufficient labor for one (1) complete system reprogramming. This allowed reprogramming time is to be conducted for changes after project conditions, system interconnections, and required text are finalized and reviewed by the engineer. Provide unit pricing for each additional reprogramming.
3. Once the fire alarm system is put into service, in whole or in part, and the associated building(s) are partially or wholly occupied, no software changes shall be performed without prior written permission of the Owner, or Owner's Representative.
4. Only certified manufacturer's representative trained in the specific programming software shall make changes to the fire alarm system software once the system is in service.
5. Each revision to the software shall be identified by a unique version number and date.
6. A copy of all software documentation required by this section shall be maintained on-site by the contractor, in a binder, arranged in chronological order. This binder shall be turned over to the Owner's representative at the completion of the project.
7. Prior to final payment for the fire alarm system and the beginning of the warranty period, submit the following completed project as-built documents to the Owner:
  - a. Copies of all reports for tests and inspections as required by the AHJ and as specified. Include the record of Completion and Inspection and testing forms in the format outlined in NFPA 72.
  - b. All permits and licenses required to be in the possession of the Owner by the AHJ.
  - c. As-built drawings of the complete installation to include, but not be limited to, the information required by paragraph "PROJECT AS-BUILT DOCUMENTS" for the shop drawings. All information shall accurately show the completed installation. As-built drawings of the floor plans shall be AUTOCAD generated.
  - d. Original warranty documents including, but not limited to, those of the FAEM. Warranty documents shall reference and be binding to the warranty provisions specified.
8. Prior to final payment for the fire alarm system, acceptance of the system as complete, and the beginning of the warranty period, submit as-built documents in accordance with the Contract Documents.

J. OPERATION AND MAINTENANCE DATA

1. Upon completion of construction, submit three (3) sets of equipment warranties and three (3) sets of operation and maintenance instructions in accordance with the Contract Documents.

K. WARRANTY

1. Repair all defective workmanship or replace all defective materials for a period of one year from the date of acceptance by the Owner. Workmanship or equipment found to be defective during that period shall be replaced without cost to the Owner.



2. The warranty or any part of the warranty shall not be made void by any required maintenance, operation or inspection of the system after acceptance during the warranty period. The Owner may, at the Owner's option, select qualified firms other than Warrantor to provide maintenance, required tests and inspections. System testing and inspections will be conducted only by a duly licensed company under contract with the Owner to perform scheduled maintenance, testing and inspections as required by the Local Authority. The Warrantor may elect to have a representative present at the scheduled testing during the warranty period.
3. Warranty shall be documented by the issuance of a written service agreement in the name of the Owner.

## PART 2 - PRODUCTS

### A. ACCEPTABLE MANUFACTURERS

1. Match existing fire alarm system manufacturer.

### B. CONTROL PANEL

1. Existing to remain.

### C. Auxiliary Power Supplies

1. Existing to remain.
2. Where required, provide additional auxiliary power supply unit in an individual, single, self-contained, lockable cabinet. Input shall be 120 volts AC nominal with an output of regulated 24 volt DC. Unit shall be capable of actuation from either a host panel notification circuit, or programmed dry contacts. Unit shall provide "trouble" indication to host panel upon loss of AC power or abnormal conditions on individual output circuits. Unit shall have a minimum of four (4) output notification circuits rated individually at a minimum of (2 / 3) amperes available per circuit. Unit shall be capable of (8 / 6) amps total output. If units providing equivalent operational features are approved, the Contractor shall be responsible for all redesign, circuiting, or additional equipment costs to provide the necessary output amperage. Each power supply shall have a minimum of 10 percent spare capacity on each circuit.

### D. FIELD DEVICES

1. Visual Devices
  - a. Acceptable Manufacturer: Must be UL listed for use with existing fire alarm system.
    - (1) Wheelock
    - (2) System Sensor
    - (3) Owner Approved Equal
  - b. Provide low profile visual alarm devices operable at 24 volt DC and polarized supervision utilizing a high intensity solid state xenon strobe tube and associated lens/reflector system. Connect the visual devices to supervised circuits.
  - c. Provide ceiling mounted devices in the sales areas and ceiling or wall mounted devices in back-of-house areas. Devices shall be molded of high-impact white (preferred) or red (if required by the authority having jurisdiction) thermo plastic and shall indicated "FIRE".

- d. Provide synchronization on all visual devices. Provide modules in quantities sufficient to synchronize all required devices. Modules shall be capable of synchronizing devices with candela ratings ranging from 15/75 cd to 110 cd.
- e. Where possible, provide flush mounting of appliances. Where surface mounting is necessary, provide a decorative back box skirt covering the appliance back box.

2. Audible/Visual Devices

- a. Acceptable Manufacturer: Must be UL listed for use with existing fire alarm system.
  - (1) Wheelock
  - (2) System Sensor
  - (3) Owner Approved Equal
- b. Provide low profile solid state electronic audible alarm devices operable at 24 volt DC and polarized supervised. Provide a synchronized temporal pattern tone producing a sound pressure level of 91 dBA to 98 dBA. Electro-mechanical solenoids or contacts will not be acceptable.
- c. Provide visual alarm devices integral with the audible alarm devices, operable at 24 volt DC and polarized supervision, and utilizing a high intensity solid state xenon strobe tube and associated lens/reflector system. Connect the audible/visual devices to supervised circuits.
- d. Provide ceiling mounted devices in the sales areas and ceiling or wall mounted devices in back-of-house areas. Devices shall be molded of high-impact white (preferred) or red (if required by the authority having jurisdiction) thermo plastic and shall indicated "FIRE".
- e. Provide synchronization on all visual devices. Provide modules in quantities sufficient to synchronize all required devices. Modules shall be capable of synchronizing devices with candela rating from 15/75 cd to 110 cd.
- f. Where possible, provide flush mounting of appliances. Where surface mounting is necessary, provide a decorative back box skirt covering the appliance back box.

E. CONDUCTORS

- 1. Initiation, notification and auxiliary device circuit conductors shall be type FPLP, or FPLR. Where conductors are installed in complete raceway systems, type THHN or TFFN may be used if approved by the manufacturer. Where the size or type of conductor hereinafter specified conflicts with the FAEM's requirements, the larger size or more specialized conductor type will be used.
- 2. Conductors for any non-power limited circuits shall be type NPLR, NPLFR, or THHN.
- 3. Conductors for wet locations shall be:
  - a. Types THWN or XHHW.
  - b. Type listed for use in wet locations.

F. RACEWAY

- 1. The following raceway types shall be permitted:
  - a. EMT conduit

- b. RIGID conduit
- 2. Boxes, supports, and other accessories for the raceway installation shall be listed for the application.

### PART 3 - EXECUTION

#### A. COORDINATION WITH OTHER TRADES

- 1. Coordinate closely with all other trades to expedite construction, accurately interface with related systems and avoid interferences.

#### B. INSTALLATION / APPLICATION

- 1. Furnish and install all control wiring, raceway, and outlet boxes.
- 2. Furnish and install all back-boxes, fire alarm equipment devices and appliances.
  - a. Back-boxes shall be of the exact type recommended by the FAEM as shown on the equipment and device submittals and installed per the manufacturer's installation recommendations.
  - b. Devices and equipment must be installed by personnel legally permitted and currently licensed to install the devices and equipment. The cost of installation, warranty of installation and equipment, coordination of the installation, and supervision of the installation are responsibilities of the Contractor.
- 3. Conduits, **where required**, shall be concealed from public view at all locations by routing on the inside of joists, above lay-in ceilings, over girders, within partitions or in any other manner acceptable to the Owner. All conduits shall be installed at right angles to the building walls, floors and ceilings.
- 4. All wiring for the fire alarm system shall be installed in conduit **where subject to physical damage or where concealed within walls. For wall mounted devices, provide outlet box with 90-degree elbow terminating above ceiling in an accessible location. Provide non-metallic conduit bushings on conduit ends.**
- 5. Conduits, **where required**, shall be supported in a manner and at intervals compliant with NEC requirements. **Fire alarm conductors** installed above lay-in ceilings shall be supported from the building structure and shall not be permitted less than 9-inches above or behind removable panels or ceiling tiles.
- 6. Raceways shall be installed exposed in finished areas only upon approval of the Owner's Representative. Provide surface-mounted metallic raceway for these circuits.
- 7. All wires shall be tagged at all junction points and shall test free from grounds or crosses between conductors.
- 8. No other conductors shall be installed in conduits with conductors for the fire alarm system.
- 9. Final connections between equipment and the wiring system shall be made under direct supervision of a representative of the FAEM. If other personnel are required by the Local Authorities to be present during final connections, this shall not relieve the Contractor of the responsibility of providing a representative of the FAEM for direct supervision.

#### C. EQUIPMENT MOUNTING

- 1. Wall mounted audible/visual, audible and/or visual devices shall be mounted with the bottom of their

lens at 80-inches above the finished floor or 6-inches below the ceiling, whichever is lower.

2. Ceiling mounted audible/visual, audible and/or visual devices shall be mounted where shown on the drawings with their visual lenses having an unobstructed line of site in all directions. Exact locations of devices shall be sufficiently distant from vertical surfaces and hanging items to permit maximum viewing from all directions.
3. Devices and appliances shall not be supported by ceiling tiles. Devices and appliances shall be attached to a back-box supported by the ceiling grid.

#### D. PAINTING AND PATCHING

1. Holes in walls or floors cut during the performance of this work shall be patched or covered with standard escutcheon plates so as to completely conceal the cuts where they would otherwise be exposed to view.
2. Fire stop all penetrations of fire rated assemblies.

#### E. SYSTEM TESTS

1. Prior to performing any system testing, reprogram the existing system to include all new and relocated devices, interlocks as required to provide a complete operating system.
2. All test and inspections specified in this section shall be reported in writing and submitted in accordance with this specification section.
3. The system shall meet all the requirements of the listed applicable codes and the requirements of the Authority Having Jurisdiction (AHJ). The system tests and test documents, including those required for and by the central station, shall meet the requirements of the AHJ.
4. Provide initial acceptance testing of the entire fire alarm system prior to the required AHJ acceptance testing. Before requesting the AHJ acceptance testing, furnish a written statement to the Owner indicating the system has been installed in accordance with the approved documents and tested in accordance with the manufacturer's specifications and applicable NFPA requirements. The record of completion shall be completed and submitted as part of the written statement. Participation in all special systems testing is required when special systems are interfaced with the Fire Alarm System.
5. All testing, inspection and retesting required for certification and required for all warranty work or replacements shall meet the requirements of the AHJ. This certification, inspection, or testing shall be completed at no additional cost to the Owner.
6. Provide the testing date in writing to the Owner a minimum of two weeks before the date. The Owner may, at the Owner's option, have a representative present for testing.
7. A proposal to perform annual testing and/or inspection services shall be submitted to the Owner a minimum of three weeks before the date of initial acceptance testing. The proposal shall include all testing and/or inspection services required by the Local Authority for the two year period beginning at final acceptance of the system. The Owner has the option to accept or reject the proposal.

8. The fire alarm system will not be accepted until final testing and receipt of the testing certificates have been obtained.

END OF SECTION 26 07 20